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February 1950

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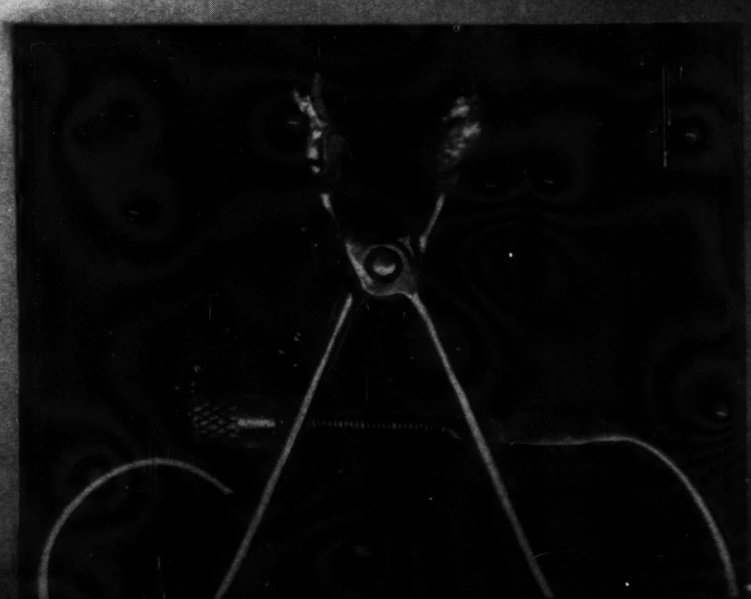

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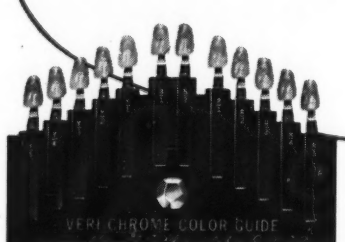

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About Our CONTRIBUTORS

T. S. Malson, D.D.S. (Western Reserve University, School of Dentistry, 1923) is a member of the American Society of Dentistry for Children, American Denture Society, Federation Dentaire Internationale, American Academy of Cleft Palate Rehabilitation. Doctor Malson publishes in Dental Digest for the first time this month. His article is Acrylic as a Restorative Material.

S. Irving Copen, D.M.D. (Tufts College Dental School, 1918) published in April 1948, The Problem of Apprehension and Anxiety in Dentistry, and in May 1948 Premedication by Co-medication which described a method designed to relieve distressed patients. In the current issue of Dental Digest, Doctor Copen presents Salivary Secretions Reduced by Co-medication in Local Anesthesia, a procedure in which atropine is combined with an injection local anesthetic.

Herbert A. Lichtenstein, D.M.D. (Tufts Dental School, 1925) limits his practice to general prosthetics. Doctor Lichtenstein has done considerable research in the use of plastics in dentistry and has published several articles on this subject. His article this month, Maintenance of Balanced Occlusion in Fixed Plastic Prosthesis, is the third he has presented in Dental Digest.

Joseph E. Schaefer, M.D., D.D.S., and Ralph C. Rudder, M. D., D.D.S. present in the current issue Pathologic Fracture of the Mandible Following Osteomyelitis. This is the fifth article in their series of case histories dealing with problems in oral surgery.

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ACRYLIC

as a Restorative Material

T. S. MALSON, D.D.S., Cleveland

DIGEST

The term acrylic is used to designate a number of derivations of acrylic acid. The one most commonly used at the present time is known as methyl methacrylate and is the same resin used for the construction of dentures, inlays, and jacket crowns.

Some dentists are successful in the application of this material while others have difficulty with the acrylic crown and inlay. This fact indicates that (1) the restorations have not been placed judiciously, or (2) the acrylic has not been processed and handled with sufficient care. In many ways a little of both faults has contributed to a lack of success.

The author of this article, convinced that acrylic is a filling material that will give excellent service if it is properly used, has undertaken a study of the physical properties of the material for the purpose of demonstrating its possibilities as a dental material.

The Acrylic Liquid

The material is available as a powder and a liquid. The chemical constituents of the liquid and the powder are the same. The liquid represents the monomeric form of methyl methacrylate with a density of 0.945 grams per cubic centimeter. In the presence of light, air, or heat, the liquid will polymerize to the solid with a density of 1.19 grams per cubic centimeter.

The Acrylic Powder

The powder represents the polymeric form of methyl methacrylate. When the powder polymer is moistened with the liquid monomer the mass becomes plastic and the liquid which has penetrated and surrounded the powder polymerizes to form a solid mass.

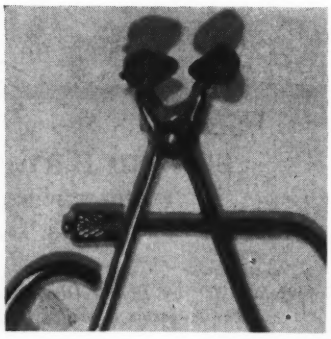
A Variation in Density

Between the monomer and the polymer there is a difference in density of 0.245 grams which means that about 20 per cent more monomer will be required to fill a given space with polymer.

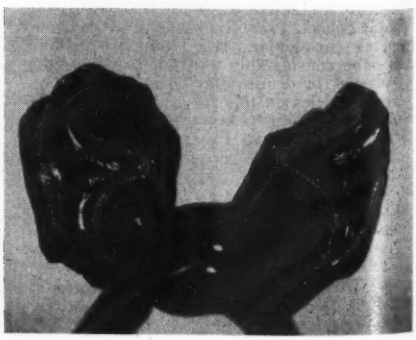
Because there is a 21 per cent contraction during the conversion, the smallest amount of monomer should be used that will make a plastic mass of the powder. It is the monomer that contracts, not the already polymerized powder.

A Natural Phenomenon—The con-

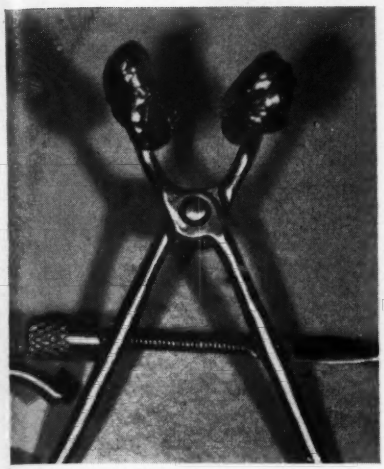
1. *Instrument used to form matrix and secure continuous spring pressure when plastic is setting.*



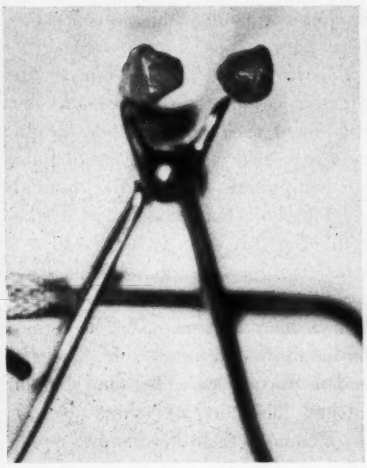
2. *Compound formed to a wedge in trays of the instrument ready to secure approximal matrix.*



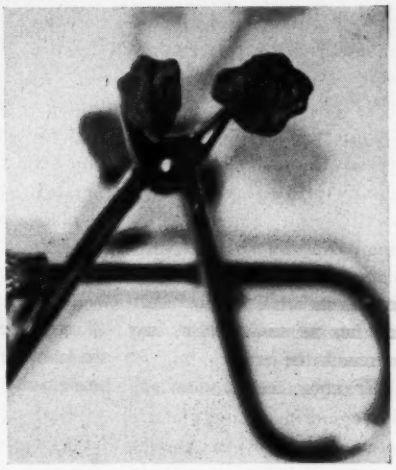
3. *Compound matrix for an approximal cavity.*



4. ***Compound matrix for an approximal cavity involving the incisal edge. The compound is lined with tin foil.***



5. ***Compound formed to a flat mound for a gingival matrix.***



6. ***Compound matrix for a gingival cavity.***

traction during conversion cannot be prevented. It can, however, be compensated for in two ways: (1) by using the least amount of liquid monomer that will moisten the powder polymer, and (2) by placing an excess of the resulting plastic mass in the cavity and using a continuous spring pressure on the mass during the setting or conversion period. By combining these two compensating methods, the lineal shrinkage is reduced to about ½ of 1 per cent.

Curing Shrinkage can be Reduced—The curing shrinkage is .52 per cent on material cured at 212° Fahrenheit. At a curing temperature of 160° Fahrenheit, the shrinkage is reported to be reduced to .37 of 1 per cent. The temperature of the cavity is approximately 98° Fahrenheit. It is, therefore, reasonable to believe that the curing shrinkage will be further reduced if the material is properly handled.

Absorption of Water Remains the Same—When the set material comes in contact with moisture it will absorb a certain amount of water. There are no means to prevent this absorption. All the tests indicate that the amount of water absorbed is always the same regardless of the length of time the material is in contact with the water. The absorption of the water causes an expansion of 0.43 per cent which just about neutralizes the contraction

Bacterial Invasion.—The possibility of bacterial invasion with the water absorption has been denied by S. Leonard Rosenthal:[1] "Experiments indicate that bacteria cannot penetrate set methyl methacrylate."

Considerations Governing Acrylic as a Filling Material

1. The strength and surface hardness of acrylic should be compared with filling materials that have been used for a number of years.

2. It must be borne in mind that acrylic is a plastic material and is used to the best advantage when moist but not too wet.

3. All plastic materials now used in the mouth, acrylic, silicate, or amalgan, behave in the same way and the surface hardness, the crushing or tensile strength of the material can be altered by the manner in which it is handled.

Surface Hardness—The Knoop tests show the surface hardness of the following materials:

Acrylic	17 - 20
Silicate	40 - 79
Dentin	58
22-carat gold (cast) dark	76
Amalgam	45 - 90
Enamel (tooth)	276
Porcelain	415

[1]Rosenthal, S. Leonard: Permeability of Acrylics to Bacteria, J.A.D.A. 31:220-222 (February 1) 1944.

Strength—Tests show plastics to vary in strength as follows:

Acrylic (tensile)	6900 - 7900
Silicate (crushing)	10000 - 27000
Alloy (crushing)	34000 - 52000
22-carat gold (tensile)	38000 - 51000

Conclusions—Based on the information gained from the tests, acrylic is not advised in the following situations: 1. For an occlusal restoration because it is not as hard as dentin and clinical experience has shown that dentin will not withstand occlusal wear.

2. For a two-surface restoration in a posterior tooth, because its strength is shown to be far below silicates which have given poor service in such locations.

Advantages of Acrylic Material

1. Because it is a noncrystalline substance, acrylic is much tougher than the silicate cement.

2. It is not susceptible to disintegration by contact with mouth fluids.

3. It does not seem to be susceptible to color change because of alternate drying and wetting in the anterior teeth of mouth breathers.

4. Because it is not susceptible to chemical change in the mouth fluids, it will not stain and change color in the mouth when properly condensed.

5. Limited clinical tests indicate that acrylic is tolerated well by the soft tissues in gingival cavities.

6. Experiments in the pathology department at Western Reserve University indicate that the reaction set up by processing the acrylic in the cavity is not as great as that of placing a zinc phosphate, copper, or silicate cement filling. In all of the experiments the acrylic was placed directly into the cavity without any protection for the pulp.

7. The acrylic material, when set, is a good insulating material. All that is needed, therefore, is some material to protect the pulp from possible injury from the liquid monomer during the conversion period.

Procedure

For the shallow cavity or full jacket preparation the following is the method preferred: 1. Cauterize the floor of the cavity with phenol and dry.

2. When the cavity is moderately deep, burnish a thin layer of fiberglas over the floor of the cavity. Fiberglas is considered a perfect insulator and is easily burnished with little pressure if the short fiber pellets are used. Because of its color and ease of handling there is little danger of leaving the fiberglas on the cavity margin or side wall.

3. For a deep-seated cavity close to the pulp a base cement is used in which is incorporated a small quantity of thymol. This mixture sets quite rapidly and can be carved with a bur if necessary.

4. The cavity preparation for the acrylic restoration should be the same as for the silicate filling. Advantage should be taken of all possible undercuts and the margin should be square without bevel.

Placing an Acrylic Restoration—1. Secure a satisfactory compound impression of the labial or buccal and the lingual surfaces of the tooth to be restored, and of the approximating tooth or teeth, if present.

2. If the cavity is formed so that the compound cannot be removed, the contour is restored with gutta percha. The compound impression is then taken.

The Instrument Used—For securing the compound impression the instrument used is a plier-like appliance with two cups or trays to hold the compound against the lingual and labial or buccal surfaces of the teeth (Fig. 1).

Description—The handle is scissors-like except that the curved part of one handle is extended to cross the handle of the other side. The extended part is threaded and has a notched lock nut and thumb screw which engages the other handle. When the lock nut is tightened with the gadget in place it exerts and maintains a spring pressure of 72 pounds direct thrust. This has been found to be sufficient pressure to condense the acrylic material thoroughly and reproduce any form taken in the compound matrix.

Technique

1. After the tooth has been contoured, the tooth and the adjacent teeth, are lubricated, and compound is securely luted to and around the cups. While still soft the coupound is molded to a wedge shape or flat mound and chilled (Fig. 2).

2. The edge of the compound is then softened in the flame and the handles squeezed. This forces the softened compound to reproduce sharply the contacted surface form.

3. If the cavity to be filled is an approximal, the compound matrix (Fig. 3) is removed from the teeth, chilled, and put aside until the cavity is ready to fill.

4. If the approximal cavity involves the incisal edge or is of any other type, tin foil is placed over the area to be filled, the compound matrix is replaced, and the handles are squeezed. This forces the foil to reproduce the tooth contour.

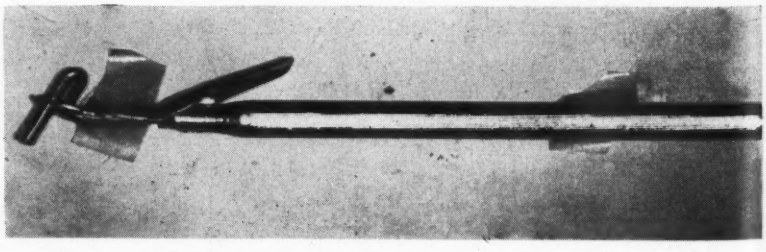
5. The tin-foil-lined compound matrix is removed, chilled, and laid aside until the cavity is ready to be filled (Figs. 4, 5, 6, and 7).

6. *The compound must not be permitted to have direct contact with the acrylic material during the setting period.*

7. When the cavity is prepared, the acrylic powder of the selected shade is placed in a small glass jar and using an eye dropper, enough of the accelerated liquid monomer is added barely to moisten the powder.

7. *Compound matrix for gingival cavity lined with tin foil.*

8. *Stainless steel strip placed to receive acrylic material.*



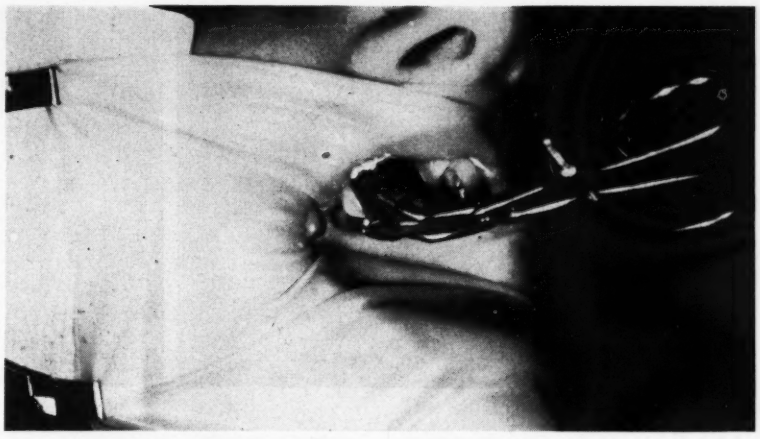
9. *Contra-angle amalgam carrier, large size.*

The lid is placed on the jar and if the powder is the rounded pearl type, the timer is set for three and one-half minutes. If the powder is the fine flour-like type, the timer is set for one and one-half minutes.

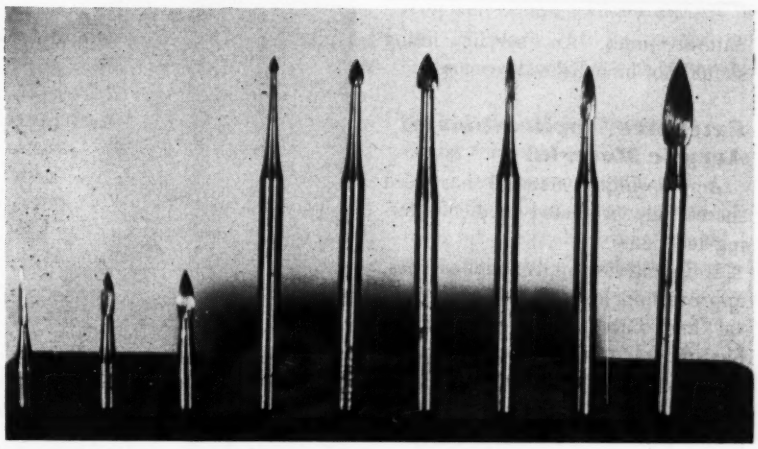
8. If the cavity is an approximal, an extremely thin, stainless steel matrix strip is used (Fig. 8).

9. At the end of the period, the moistened powder is spatulated until it becomes a gummy mass. With the aid of an amalgam carrier (Fig. 9) the cavity is packed to excess. The compound matrix is then placed and pressure is applied with the thumb screw (Fig. 10).

10. When the teeth are short or a locking compound matrix cannot be secured, it will be necessary to hold the matrix plier in position for about three minutes until the acrylic material begins to set. The compound matrix should remain in place for ten minutes. When the matrix is removed, the contour of the tooth will be restored and there will be a thin flash of acrylic to the margin of the matrix. The bulk of the excess will be squeezed beyond the edge of the matrix.



10. *Acrylic material in cavity. Matrix instrument in place until set.*



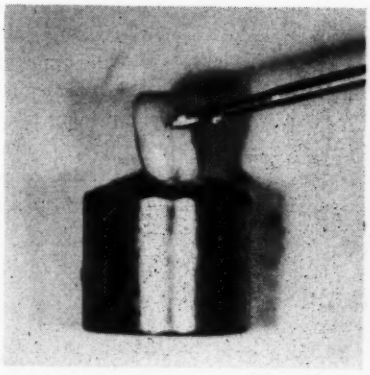
11. *Various sizes of flame-shaped plug finishing burs.*

Additional Instruments

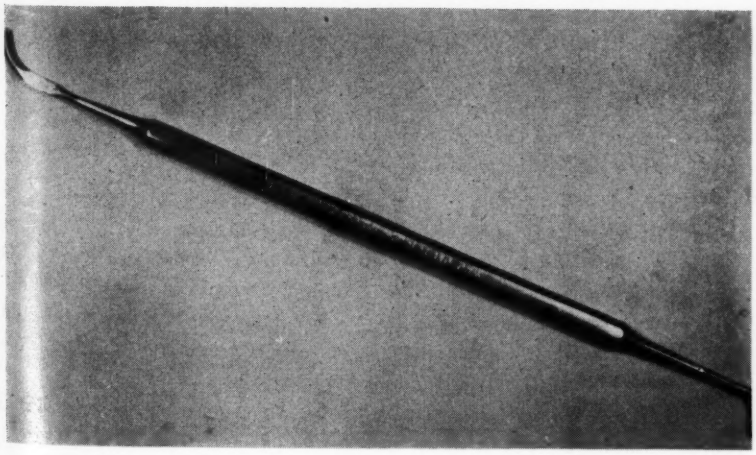
1. The instruments used for trimming the thin flash are sharp flame-shaped plug finishing burs revolved at a very slow speed (Fig. 11). A fast-turning bur creates heat which is undesirable on the margin of the filling (Fig. 12).

2. When access with the plug finishing bur is not possible, sharp gold knives or a Weeks carver, sharpened at both ends, are used (Fig. 13). This instrument can be used for all surfaces of the anterior teeth.

12. *Plug finishing bur, supported by tooth, follows the contour of tooth.*

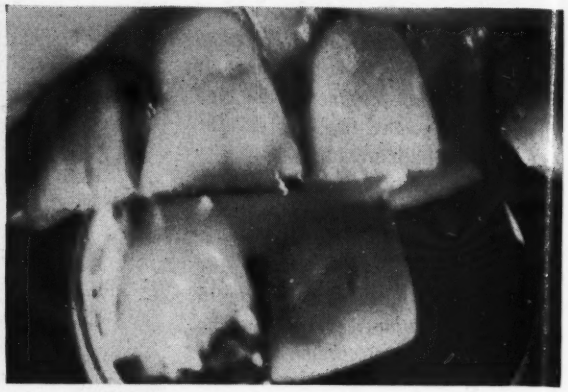


13. *Weeks carver sharpened at both ends.*



3. Slow plug finishing bur and sharp knives give the filling about the same finished appearance as the

14. *Acrylic window in a three-quarter crown (first bicuspid.)*



16. *Three-quarter crown, two shade, processed direct.*

natural tooth. An acrylic filling should not be polished.

Extensive Applications of Acrylic Material

Acrylic filling material has been successfully processed in the following locations:

1. In anterior approximal cavities, approximoincisal cavities, labiogingival and buccogingival cavities in bicuspids and lower molar teeth.

2. In window in inlays and three-quarter crowns with better esthetic results than when the acrylic is processed in the casting and then set with cement (Fig. 14).

3. To set large, two-shade inlays (a large acrylic restoration where it is necessary to use one shade for the incisal and some other shade to match the gingival area) and broken facings on anterior acrylic bridges (Fig. 15). For full and three-quarter crowns on broken anterior teeth that were undercut and too delicate to grind for a jacket crown (Figs. 16 and 17).

15. *X-ray showing badly broken vital central; emergency treatment necessary.*

4. To cement old Davis crowns that have loosened because of caries around the post and to set acrylic and porcelain jackets, eliminating the possibility of the discolored cement line (Figs. 18 and 19).

Summary

1. Because of its physical properties, methylmethacrylate must be processed in the mouth the same way as in the laboratory. A condensing spring pressure is a necessity.

2. Methyl methacrylate should eliminate acid disintegration which is often found when silicate and other cements are used.

3. Methyl methacrylate offers cementation possibilities not found in other materials available.

4. Methyl methacrylate offers possibilities of a finished surface that is similar in appearance to the enamel surface of the natural tooth.

5. While acrylic fillings have been processed in the mouth for about ten years, they were processed with the pure monomer without the accelerator. Possible effect of the accelerator on the chemical properties of the material is yet to be ascertained.

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Maintenance of BALANCED OCCLUSION *in Fixed Plastic Prosthesis*

H. A. LICHTENSTEIN, D.M.D., Bangor, Maine

DIGEST

Since the inception of tooth-colored plastics there has been a sharp divergence of opinion regarding the value of this material for fixed bridge prosthesis.

Some of the faults of the material were due to (1) careless manipulation, (2) improper indication, and (3) the continual search for short-cuts. In the case of jacket crowns, shoulder preparations were sometimes slighted because of relying on the toughness of the material which has great resistance to breakage. The preparation for plastics requires (a) more care, and (b) more substantial shoulders in order to counteract the resilience of the material which weakens the cement bond.

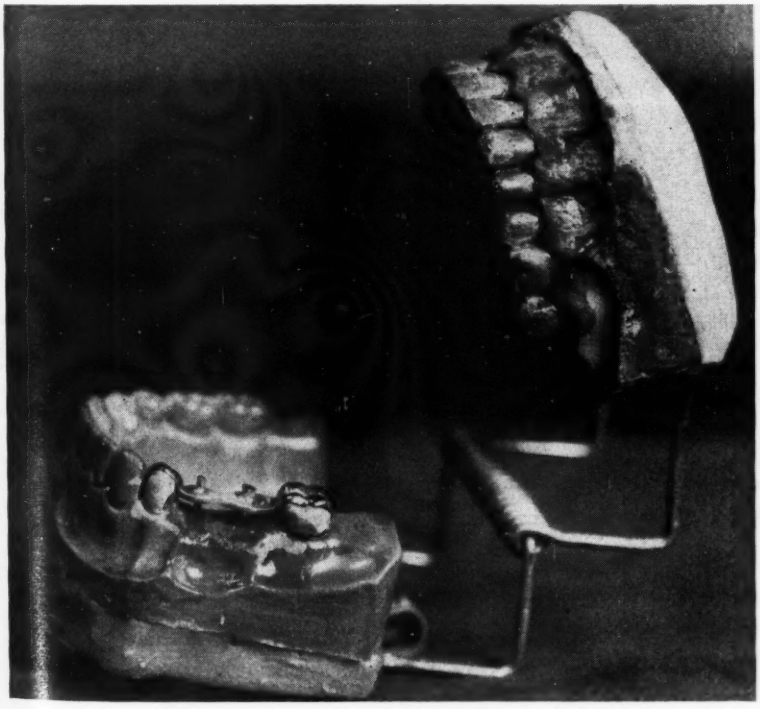
Many dental materials now in standard use passed through similar stages of experimentation. Because of (1) ease of application, (2) the economy of time and equipment, (3) the excellent tissue tolerance, and (4) the great strength of the material, continued application and experimentation should tend to minimize and eventually eliminate the shortcomings of the acrylic and enhance the desirable qualities.

The Disadvantage of Plastic Bridge Bodies

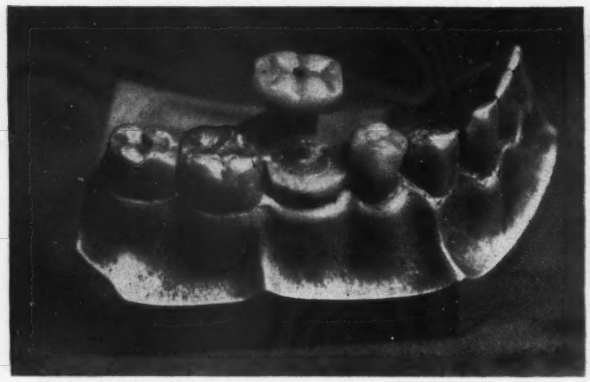
The chief objection to the use of plastic occlusal surfaces has always been the abrasion to which the material is subject. This is a serious fault and would militate against the use of plastic if the undesirable characteristic could not be eliminated.

The Use of a Suitable Gold Frame

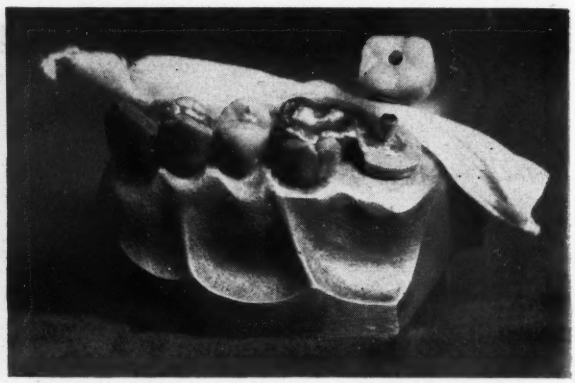
For several years the use of a gold frame has been recommended. The form of the gold frame should be such as to enable the dentist to repair breakage or rebuild worn occlusal surfaces without removal of the appliance from the mouth (Fig. 1). Figure 2 shows how replacement is accomplished: 1. The worn or broken surface is removed so that the entire



1A. *Bridge frame on model. Abutments are three-quarter crowns.*
1B. *Plastic bridge body made of clear acrylic to demonstrate the position of frame therein.*



2A. *Bridge consisting of three-quarter crowns and frame. The molar pontic has been prepared for a new occlusal surface which is ready for cementation.*



2B. *A case similar to Figure 2A. The cantilever molar supply is shown with the new occlusal surface detached.*

upper part of the post and the frame table is exposed. 2. A direct wax build-up is made in the mouth, removed, transposed into plastic and cemented into position. 3. The frame is readily made from baseplate wax and ready-made round wax forms, gauge 12 to 14 (Figs. 3 and 4).

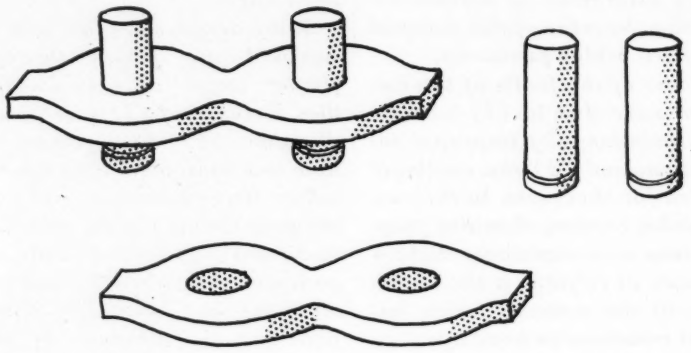
Self-Curing Acrylic

The introduction of the self-curing acrylics has opened new possibilities of great promise. The procedure for the use of this material is the following:

1. Abutment castings are made of a suitable gold alloy, usually of the B type. Harder golds are rarely necessary because proper abutment preparation automatically provides sufficient bulk of gold. It has been found that when acrylic is cured directly against a roughened gold thimble, the acrylic often cleaves away from the thimble. A cemented crown veneer seems to stand up much better. Acrylic facings cured into box-like recesses of gold abutments are virtually indestructible in the mouth but lack esthetic qualities. When esthetic requirements do not make such crowns mandatory, an all-gold abutment is satisfactory.

2. Abutment castings are placed on the teeth in the customary manner, a plaster impression is secured, and a stone model made.

3. The cast frame is placed between the previously loosened abutment castings, assembled with sticky wax, removed, embedded, and soldered.



3. *Upper part shows waxed-up frame preparatory to casting. Lower part shows wax frame and posts before assembly. Construction between posts is necessary for anatomic outline of tooth.*

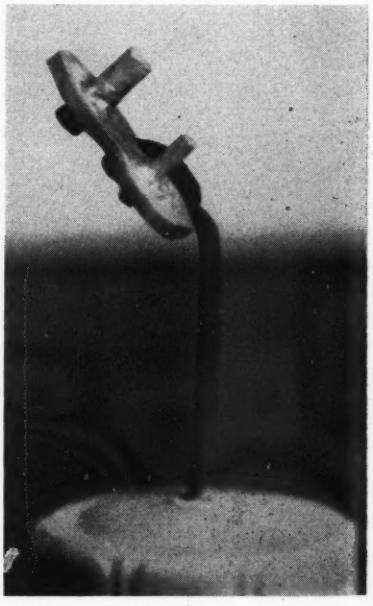
4. Articulation is required to insure proper length of the frame posts.

5. The bridge abutments are polished prior to the wax build-up for which pink base wax or ivory wax is used. The use of blue or other heavily pigmented waxes is to be avoided because of the possibility of discoloration of the mold.

6. The bridge is embedded and cured in accordance with the techniques of choice. At this stage only dentin-colored acrylic of the regular curing plastic is used. Because no enamel shade blending is required the process is easy and rapid.

7. After curing, the bridge is polished.

8. The occlusal surface and some of the lingual and buccal surfaces are reduced approximately 2 millimeters.



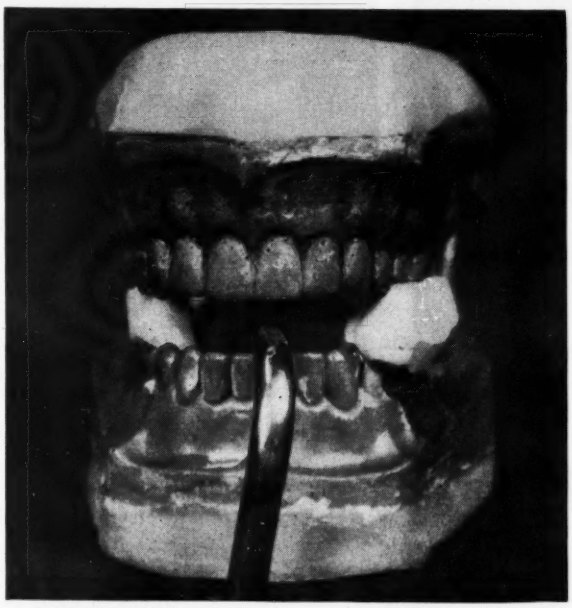
4. *Frame after casting.*

9. The structure is now carefully cemented to place and pin or ivory wax is melted on the occlusal surfaces. Because of the reduction by grinding, the occlusal surface does not come in contact with the antagonists. After the wax is applied the patient is asked to occlude in function.

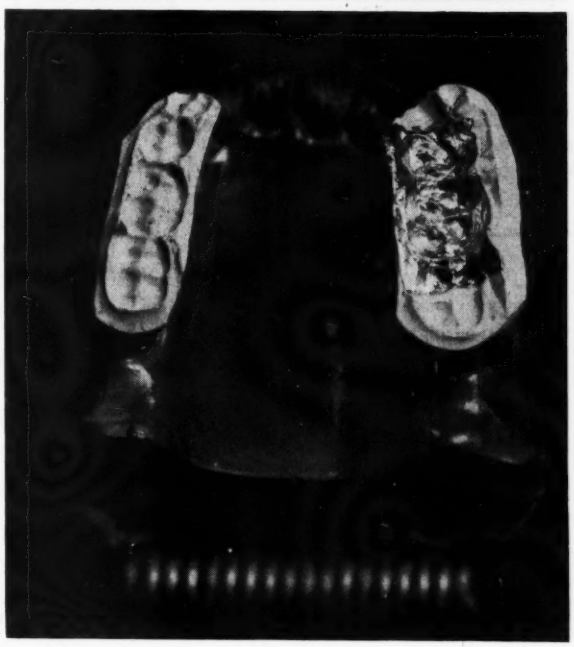
10. The cusps are carved in conformity with the excursions. Care is taken to provide ample sluice gates.

11. The wax is carefully polished with small cotton balls slightly moistened with oil of cajeput. The oil is removed with traces of acetone.

5. *Acrylic bridge showing plastic veneers used over gold thimbles.*



6. *Key, matrix, and aspirator tip in position. Casts have been used instead of a patient for the sake of clarity.*



7. *Key and matrix in position before self-curing acrylic has been applied. Matrix shows lining of tin foil on the replacement side.*

Key and Matrix

1. A small mix of stiff dental stone is made and placed on the waxed cusps and the neighboring abutments. An equal amount of stone is applied to the occlusal surfaces of the corresponding molars and bicuspids.

2. Four tongue depressors or a block of wood or rubber of the same thickness must be placed on the incisal edges of the anteriors.

3. The patient now closes until the anteriors come to rest against the block.

4. The space provided by the block (1) enables placement of an aspirator tip later, and (2) provides sufficient bulk of stone for strength.

5. After hardening, stone matrix and key are removed and neatly trimmed for comfort.

6. A small amount of white rubber cement, obtainable in stores under the name paper cement, is placed in the cusp negatives of the matrix and tin foil, 5/10000″, is burnished into them.

7. Tin foil is skillfully adapted with dampened cotton pellets and suitable burnishers.

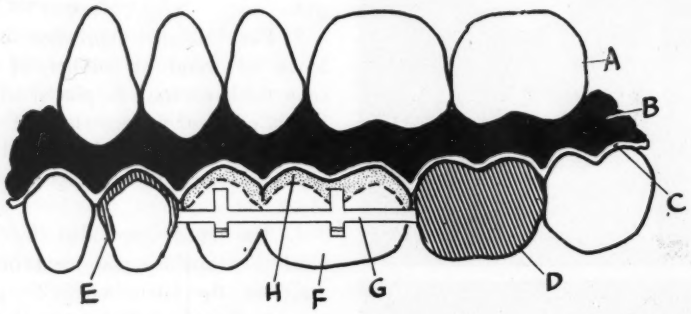
8. The waxed and carved cusps are removed from the cemented bridge, provided it has not come free with the matrix.

9. All wax must be carefully removed.

10. The tin-foiled cusp negatives

8. ***Bridge cemented into place.***

9. ***Complete bridge as it would appear in the mouth. Only lingual and buccal surfaces require polishing.***



10. ***Showing how self-curing acrylic is pressed to position. (A) Antagonizing posteriors; (B) stone matrix line with (C) tin foil; (D) molar abutment; (E) bicuspid abutment; (F) dentin-colored bridge supply; (G) gold skeleton; (H) enamel-colored self-curing acrylic.***

are filled with a pliable mix of self-curing acrylic. Only a suitable enamel shade is required.

11. Moisten the reduced surfaces of the cemented bridge with a little monomer (self-curing, ordinary monomer is not suitable.)

12. The matrix and key are now placed in their respective positions and the patient is asked to close his teeth until both sides rest solidly against the stone.

13. The aspirator tip is placed over the lower anteriors, the thickness of the previously used block providing just enough space for even the thicker type of tips. The aspirator will keep the field reasonably dry. The self-curing acrylic will harden in fifteen minutes or less. Both key and matrix may then be removed.

14. If sufficient care has been used when burnishing the tin foil, only a slight flash buccally and lingually will require grinding and polishing. Wet stones and rubber polishers followed by felt and whiting are satisfactory.

The Use of Separating Media Other than Tin Foil

Instead of tin foil the following may be used: (1) moist cellophane, (2) alginate separators, or (3) a little vaseline. Tin foil, however, is preferred. The following experiment is recommended to test the efficacy of tin foil as a separating media: Four pieces of clear plastic are cured between layers of (a) tin foil, (b) moist cellophane, (c) alginate separator, (d) vaseline. All this can be done easily in one flask. The results will be (a) optically clear, (b) fairly clear, (c) cloudy, (d) extremely cloudy. The cloudiness cannot be removed by grinding and polishing which indicates that the discoloration is not a surface discoloration but one which has become an integral part of the plastic. The same is true with pink or tooth-colored acrylics except that the color disturbance is concealed to an extent by the pigment. It is, however, present and the color is impaired in consequence.

Records

Both matrix and key are inscribed with the patient's name, the date, and the enamel blend used. They are filed

for future reference. When rebuilding of the cusps is indicated it is only necessary to reline the cusp negatives with tin foil and follow the procedure described. When recusping will be required cannot be predicted as several factors influence the amount of abrasion (1) the material of antogonizing cusps, (2) personal habits (smoking, tobacco chewing, gum chewing, and others).

Conclusion

1. The introduction of self-curing resins has made the maintenance of balanced occlusion easy, rapid, and economical.

2. The process may easily be applied to removable splints and bite raisers.

3. Acrylic plastic is a useful material for stationary prosthetic appliances.

4. It is possible to overcome the objection of undue abrasion by reconstructing the appliance in the mouth with little expenditure of time. Balance of occlusion may thus be indefinitely maintained.

5. Repair of the acrylic bridge body is possible without resorting to removal.

142 *Pine Street.*

Chemosurgical Treatment of Tumors of the Parotid Gland

Mohs[1] stresses that in the treatment of tumors of the parotid gland complete removal of the neoplasm must be combined with the preservation of as much as possible of the facial nerve, which traverses the parotid gland. The attainment of these goals is facilitated by the use of the chemosurgical technique. Application of this method in the treatment of cancer of the lip, nose, ear, eyelid, face, extremities, trunk, and skin has been described earlier.

Case Report

A man aged 80, with a deep-seated mass just below the ear, is reported by the author.

Premedication—In this case 0.015 gram of morphine sulfate was followed by application of the keratolytic dichloracetic acid. Whitening of the skin indicated when the keratin layer had been penetrated.

Treatment—1. The zinc chloride fixation paste was then applied in a thickness of about 3 millimeters. The paste contained stibnite (80 mesh sieve) 40 grams, powdered sanguinaria, 10 grams, and saturated solution of zinc chloride, 34.5 cubic centimeters. The treated area was covered with cotton.

2. After twenty-four hours a layer about 1 centimeter thick was excised. There was no pain or bleeding, because the incision was made through killed and fixed tissue. Frozen sections revealed the presence of squamous cell carcinoma with grade 3 malignancy.

3. During the next four days the tumor mass was removed in successive layers. On the fifth day it became impossible to differentiate grossly between normal and cancerous tissues.

4. The layers of tissue from the areas in question were divided into specimens of convenient size; frozen sections were cut and scanned under the microscope and the areas of cancer were marked on a map corresponding to a map drawn on the lesion.

The Process Repeated—The fixative was then reapplied and limited to the areas demonstrated to be cancerous. The process was repeated daily until the twentieth day, when the removal of the last extension of the cancer was completed.

Systematic Microscopic Control of Extreme Value—1. In some areas the microscopically visualized extensions of the neoplasm extended more than 2 centimeters beyond the grossly visible portion.

2. One extension followed the perineural lymphatics of the auriculotemporal nerve, while another followed the perimesium of the stylohyoid muscle.

3. Without the systematic microscopic control afforded by the chemosurgical method these extensions would have been missed.

Healing Complete

1. On return for checkup two months later the lesion had completely healed with a fine linear scar.

2. The patient was free of cancer when last seen seven years later.

3. Despite the extensiveness of the lesion there was no facial nerve paralysis except for the mandibular branch.

Conclusion

1. Thirteen of the 17 patients treated by this method had carcinoma and 4 had benign mixed tumors of the parotid gland.

2. The rate of cure in the patients with carcinoma was 60 per cent in the five-year period of observation.

3. All of the patients with benign mixed tumor of the parotid gland were successfully treated.

From Current Medical Literature, *Journal of the American Medical Association* **140**:1179 (August 6) 1949.

[1]Mohs, F. E.: Chemosurgical Treatment of Tumors of the Parotid Gland: Microscopically Controlled Method of Excision, Ann. Surg. **129**:289-416 (March) 1949.

SALIVARY SECRETIONS

Reduced by Co-Medication in Local Anesthesia

S. IRVING COPEN, D.M.D., Boston

DIGEST

The object of the research the results of which are reported in this article was to determine, because of excessive salivation, the feasibility of the use of atropine sulfate with an injection local anesthetic.

In a paper presented in 1946, on premedication by co-medication in local anesthesia[1] the author of this article suggested the advisability of combining an analgesic sedative with an injection local anesthetic. It had been noted that demerol hydrochloride in combination with an injection local anesthetic produced a general dryness of the mouth (xerostomia) with a lessening of the salivary secretions.

Because of the atropine-like action of the demerol hydrochloride, investigation was undertaken concerning the use of atropine sulfate to reduce the salivary secretions using a co-medication technique. The method used was a combination of atropine sulfate with an injection local anesthetic in one solution, producing a reduction in the salivary secretions with local anesthesia at the same time.

The results obtained from the use of atropine sulfate (1/150 grain) in combination with an injection local anesthetic are presented in this article. Several case reports in which this method was successfully employed are included.

Anesthetic Agents

1. Monocaine hydrochloride and procaine hydrochloride are widely used in dentistry.

2. Atropine and atropine sulfate are less frequently used in the dental office.

Atropine[2]

Atropina (Atrop.) U.S.P. is an alkaloid usually obtained from belladonna.

Action and Uses—Atropine and the related alkaloids paralyze the parasympathetic nerve endings in muscles and glands.

Dosage—The dose given is 0.4 milligrams (1/150 grain, U.S.P.).

Atropine Sulfate[2]

Atropinae Sulfas (Atrop. Sulf.) U.S.P. is the sulfate of an alkaloid obtained from *Atropa belladonna*. It appears as a white crystalline powder, having an extremely bitter taste and is easily soluble in water and alcohol.

Action and Uses—In dentistry atropine sulfate is used as a physiologic agent for arresting or lessening secretions. Its other specific effects on the eye and central nervous system are of less importance for the present consideration.

Dosage—The dose given is 0.5 milligrams (1/120 grain, U.S.P.).

Caution—Atropine and atropine sulfate are extremely poisonous (U.S.P.).

Dosimetric Table[3]

The following table, adapted from Schmiedeberg, shows the usual progression effects of therapeutic and toxic doses of atropine sulfate:

Mg.	*Grains*	
0.5	1/120	*Slowing of pulse and slight dryness of throat.*
0.5 to 1.0	1/120 to 1/60	*Dryness in mouth, often with thirst.*
2.0	1/30	*Pupils dilated, not quite immobile. Increase of pulse rate.*
3.0 to 5.0	1/20 to 1/12	*Headache. Dysphagia. Alteration of voice. Muscular weakness. Restlessness.*
7.0	1/10	*Considerable dilatation of pupils. Disturbance of vision.*
8.0	1/8	*Excitement and muscular incoordination more marked.*
10.00	1/6	*Apathy. Hallucinations or delirium. Unconsciousness.*

[1]Copen, S. Irving: Premedication by Co-medication in Local Anesthesia DENTAL DIGEST **54**:309-314 (July) 1948.
_____: Premedication by Co-medication in Local Anesthesia, Am. J. Orthodontics **33**:290-300 (April) 1947.
[2]Prinz, Hermann; Rickert, U. Garfield; and Dobbs, Edward C.: St. Louis. The C. V. Mosby Company, Pharmacology and Dental Therapeutics, ed. 8, 1941, p. 370.
[3]Sollman, Torald: Philadelphia, W. B. Saunders Company, A Manual of Pharmacology, ed. 6, 1945, p. 374.

Adult Dose—Atropine sulfate can be used (within safety limits) should there be need for reducing the salivary secretions. The average adult dose of atropine sulfate for this purpose is 1/150 to 1/120 grain, administered parenterally or by mouth.

Varying the Doses—In the suggested procedure to reduce the salivary secretions in the dental patient, the dosage of atropine sulfate varies 1/150 grain to 1/120 grain depending on the conditions. The dosimetric table shows these amounts to be within safety limits.

Monocaine Hydrochloride and Procaine Hydrochloride Are Compatible with Atropine Sulfate

Two methods of combining monocaine hydrochloride and procaine hydrochloride with atropine sulfate are shown, depending on the type of syringe used. The syringes referred to are the Novocol Anestube Syringe and the Cook-Waite Syringe.

Armamentarium, Method Number One

The Novocol Anestube Syringe—1. The Anestube contains 2.25 cubic centimeters of monocaine hydrochloride solution (1.5 per cent with epinephrine 1:100,000).

2. The Anestube has a recessed threaded rubber plunger into which the piston rod of the syringe is screwed.

3. The Anestube is held firmly in the syringe by a knurled screw which is screwed tightly against the Anestube (Figs. 1 and 2).

Ampuls of Atropine Sulfate—1. The 20-cubic-centimeter ampuls (419-Eli Lilly and Company) have rubber-covered caps which facilitate the insertion of the hypodermic needle for the withdrawal of the amount of atropine sulfate desired.

2. The concentration of atropine sulfate in the ampuls is 1/150 grain (U.S.P.) per cubic centimeter.

Method of Handling the Syringe—The syringe is so constructed that the body has two finger grips and the handle (piston rod) a third grip to engage the thumb.

1. The syringe is opened wide to permit the easy placing of a monocaine hydrochloride Anestube (2.25 cubic centimeters).

2. The knurled screw in the upper part of the body of the syringe is screwed down firmly against the Anestube in the syringe. The piston rod is screwed into the threaded rubber plunger.

3. Approximately 1.0 cubic centimeter of monocaine hydrochloride is expelled from the syringe by pushing the handle down. This takes up a space of approximately ¾ inch in the upper end of the Anestube. Notches placed on the syringe facilitate the combining of these medicaments (Figs. 3 and 4).

4. The needle of the syringe is next inserted into the sterile cap of the ampul containing the atropine sulfate. The piston rod is pulled back to its former position. This step draws into the monocaine hydrochloride solution about 1.0 cubic centimeter of atropine sulfate (approximately 1/150 grain) (Figs. 5, 6, and 7).

5. The full content of the one Anestube only is then injected in the usual manner that the dentist is accustomed to use for straight injection local anesthesia. If additionl Anestubes are used, they should contain *monocaine hydrochloride without atropine sulfate.*

Armamentarium, Method Number Two

The Cook-Waite Syringe—1. The Carpule Brand Cartridge contains 2.25 cubic centimeters novocain (2 per cent) with pontocaine (0.15 per cent) and cobefrin (1:10,000).

2. The Carpule Brand Cartridge has a rubber insert on one end through which the inner point of the double pointed needle passes and a rubber plunger on the opposite end which comes into contact with the piston rod of the syringe.

3. The Carpule is held in the syringe by the lock screw which locks the syringe (Fig. 8).

Ampuls of Atropine Sulfate—1. The 20-cubic-centimeter ampuls (419-Eli Lilly and Company) have rubber-covered caps which facilitate the insertion of the hypodermic needle for the withdrawal of the amount of atropine sulfate desired.

2. The concentration of atropine sulfate in the ampuls is 1/150 grain (U.S.P.) per cubic centimeter.

Method of Handling the Syringe—The syringe is so constructed that the body has two extensions to engage the fingers and the handle (piston rod) a third extension to engage the thumb or the fold between the thumb and forefinger, depending on the choice of the operator. A special circular type of thumb rest may be adapted in place of the extension on the piston rod.

1. The syringe is unlocked and opened to permit the easy placing of a Carpule (2.25 cubic centimeters) (Fig. 9).

2. A sterile Luer type glass syringe (2.0 cubic centimeters) is inserted into the sterile cap of the ampul containing the *atropine sulfate* and 1.0 cubic centimeter (approximately 1/150 grain) of its contents is withdrawn (Fig. 10).

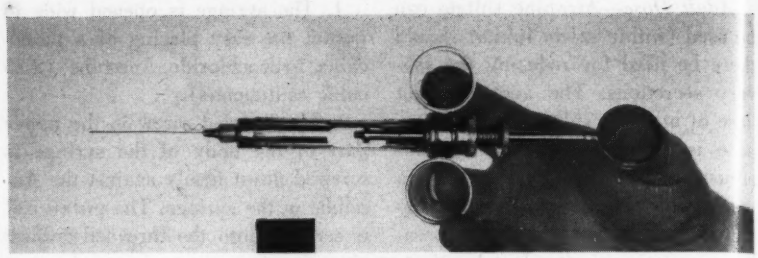
3. The Luer syringe is now removed from the ampul and inserted into the sterile rubber plunger of the Carpule (Fig. 11).

4. The Carpule connected with the Luer syringe is then placed in the barrel of the Cook-Waite syringe and after the opposite end has been punctured by the inner point of the double pointed needle the contents of the Luer syringe are pushed into the Carpule. This step causes an equal amount of novocain to be expelled through the double pointed needle on the opposite end (Fig. 12). The Luer syringe is now carefully removed and the Cook-Waite syringe is locked with the lock screw (Fig. 13).

5. The full content of the one Carpule only is then injected in the usual manner that the dentist is accustomed to use for straight injection local anesthesia. If additional Carpules are used, they should contain *novocain without atropine sulfate.*

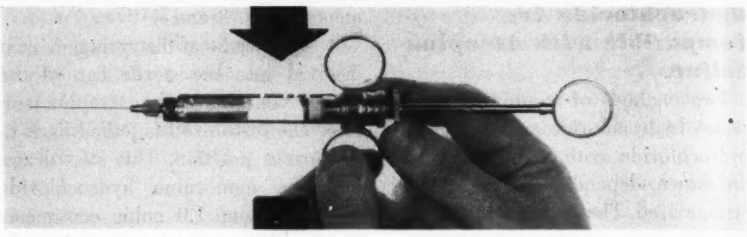
6. Adding air to the ampul of atropine sulfate after using some of its contents, will facilitate aspiration. *Method*: Sterilize the rubber cap on the ampul and add air with a sterile Luer syringe by inserting the needle of the syringe into the rubber cap

1. *Anestube syringe. Observe the knurled screw which firmly holds the Anestube and the threaded piston rod which screws into the thread of the rubber plunger.*

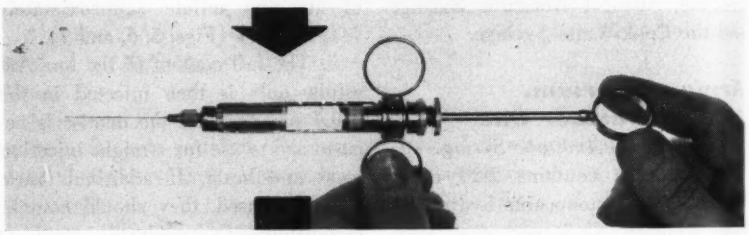


2. *Anestube containing 2.25 cubic centimeters of monocaine hydrochloride. Observe thread of recessed rubber plunger.*

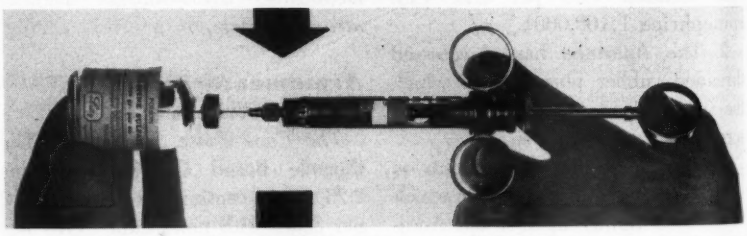
3. *Anestube syringe containing an Anestube. Turn knurled screw to hold the Anestube firmly in syringe. Observe the four small notches on the upper surface of the body of syringe. Spaces between the first three notches are each 3/16 inch. Space between the last two notches is 3/8 inch. Space between the first and last notch is 3/4 inch. Total space contains approximately 1.0 cubic centimeter of monocaine hydrochloride.*



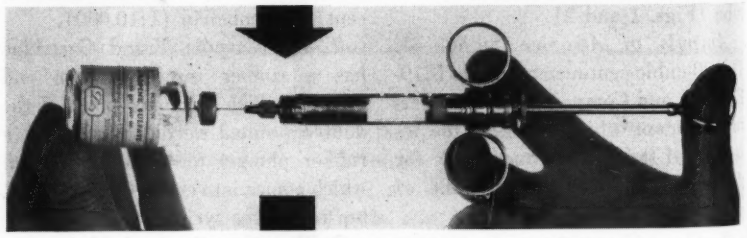
4. *Screwing threaded piston rod into thread of rubber plunger.*



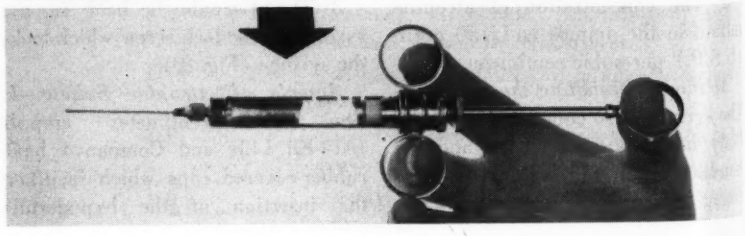
5. *Syringe with needle inserted into ampul containing atropine sulfate. Observe that the rubber plunger has been pushed down to the furthest notch. Anestube content is thus reduced from 2.25 cubic centimeters to 1.25 cubic centimeters of monocaine hydrochloride.*

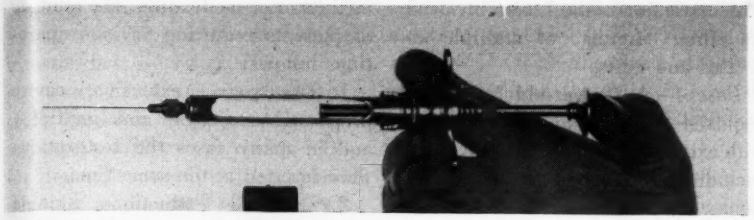


6. *Piston rod has been completely pulled back. One cubic centimeter (1.0) atropine sulfate (1/150 grain) has been drawn into the Anestube.*

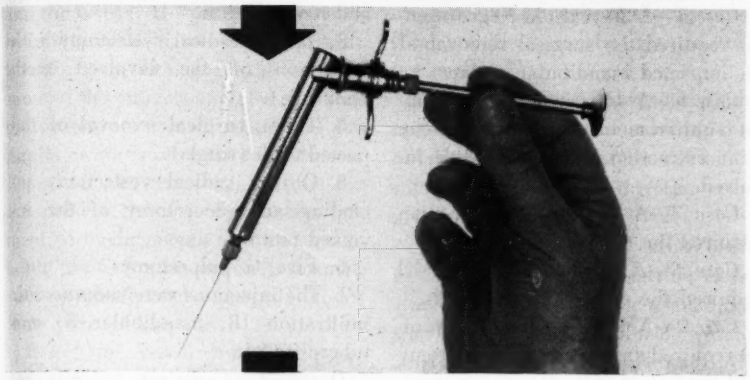


7. *Syringe with Anestube filled. It now contains 1/25 cubic centimeters of 1.5 per cent monocaine hydrochloride in combination with 1.0 cubic centimeters of atropine sulfate (1/150 grain).*

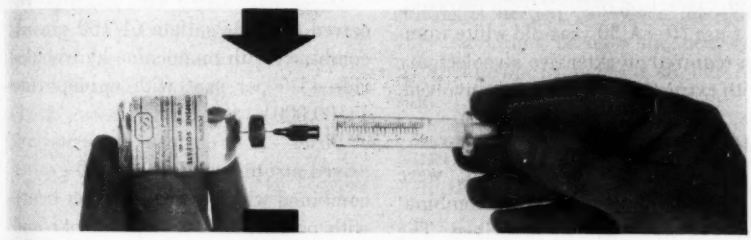




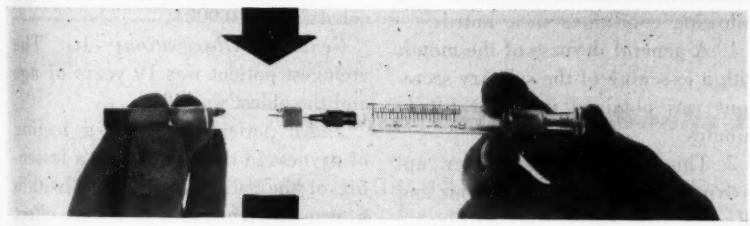
8. *Cook-Waite syringe. Observe the lock screw which firmly holds the Carpule.*



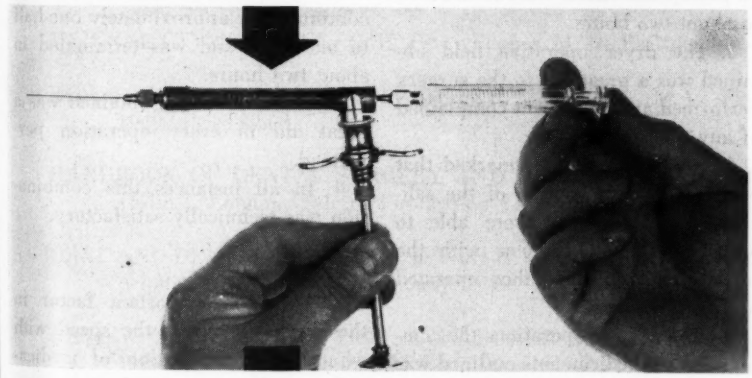
9. *Syringe is unlocked and opened to permit the easy placing of a Carpule.*



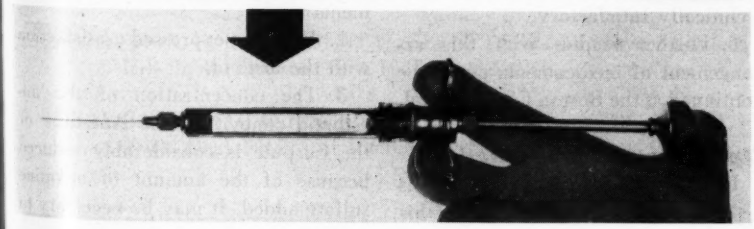
10. *Luer type glass syringe with needle inserted into ampul containing atropine sulfate. Observe that the glass plunger has been pulled back to one centimeter (1.0) mark on syringe. One cubic centimeter (1.0) atropine sulfate (1/150 grain) has been drawn into Luer syringe.*



11. *The Luer syringe removed from ampul and inserted into the rubber plunger of the Carpule.*



12. *The carpule connected to Luer syringe is placed in the barrel of the Cook-Waite syringe. The opposite end of the Carpule is punctured by the inner point of the double pointed needle. Contents of the Luer syringe are pushed into the carpule. This step causes an equal amount of novocain to be expelled through the double pointed needle on the opposite end.*



13. *Luer syringe removed. Cook-Waite syringe is locked with lock screw. The carpule now contains 1.25 cubic centimeters of 2 per cent novocain in combination with 1.0 cubic centimeter of atropine sulfate (1/150 grain).*

and forcing air into the ampul. This can also be done by using a sterile empty Anestube in the Anestube syringe and operating it as one would a Luer syringe.

Injection Procedure and Effects

1. Complete asepsis must accompany every step of the procedure.

2. The injection must be made slowly, the total time of injection being not less than one-half to one minute.

3. A general dryness of the mouth with a lessening of the salivary secretions obtains within fifteen to twenty minutes and occasionally sooner. It has been my experience that this effect continues for approximately one-half hour to one hour and the drying effect of the oral mucous linings are terminated in about two hours.

4. The rapidity of action of this combination is undoubtedly due to the fact that the tissues of the mouth are extremely vascular. This is a great help in dental procedures.

Experimental Application

On September 30 and October 7, 1949, at the Boston City Hospital, Boston, Doctor Stephen P. Mallett, Chief of the Oral Surgery Department, and his staff performed the following experiments and made the observations which are recorded.

1. Five patients (cases 1 to 5) received atropine sulfate (1/150 grain) combined with monocaine hydrochloride (1.5 per cent with epinephrine 1:100,000).

2. Five patients (cases 6 to 10) received atropine sulfate (1/150 grain) combined with novocain (2 per cent) with pontocaine (0.15 per cent) and cobefrin (1:10,000).

Case Reports

Case 1—A 45- year-old white woman required an extensive alveolectomy with extraction of the 4 teeth involved, including curettage of multiple granulomas.

Case 2—A 27-year-old Negro man required the surgical removal of an impacted mandibular third molar.

Case 3—A 43-year-old white woman required an extensive alveolectomy with extraction of the 7 teeth involved, including curettage of multiple abscesses and cysts.

Case 4—A 19-year-old Negro girl required an extensive alveolectomy with extraction of the 4 teeth involved, including curettage of multiple granulomas.

Case 5—A 20-year-old Negro woman required the surgical removal of an impacted mandibular molar.

Case 6—A 44-year-old white woman required an extensive alveolectomy with extraction of the 10 teeth involved.

Case 7—A 21-year-old white man required the extraction of 3 teeth.

Case 8—A 15-year-old white girl required the extraction of 3 teeth.

Case 9—A 66-year-old Negro woman required an extensive alveolectomy with extraction of the 9 teeth involved.

Case 10—A 30-year-old white woman required an extensive alveolectomy with extraction of the 5 teeth involved.

Observations

Ten patients, as recorded, were operated upon using the combinations of medicaments described. The following conditions were noted:

1. A general dryness of the mouth with a lessening of the salivary secretions was obtained in about fifteen minutes.

2. This effect continued for approximately one-half to one hour and all perceptible effects were terminated in about two hours.

3. The dryer operative field obtained was a great aid to the surgery performed and no patient complained of any discomfort.

4. Several surgeons remarked that because of the lessening of the salivary secretions, they were able to operate on the *lower jaw* with the same ease with which they operated on the *upper jaw*.

5. In all of the operations the combination of medicaments outlined was technically satisfactory.

6. Further studies with this arrangement of medicaments are to be continued at the Boston City Hospital.

Operations Performed

Up to the time of writing this article I treated 50 patients with this method of co-medication. The number of patients requiring various operations follows:

1. Twenty-six, extensive cavity preparations (single and multiple) and in many cases the restorations were inserted at the same time.

2. Thirteen, extractions (single and multiple).

3. Two, a radical cystectomy with extraction of the involved teeth (multiple).

4. Three, surgical removal of impacted teeth (single).

5. One, a radical cystectomy including an apicoectomy of the involved tooth.

6. Five, a pulpectomy.

7. The injections were *submucosal*: infiltration 18; mandibular 8; and tuberosity 24.

Doses—1. Thirty-six patients received atropine sulfate (1/150 grain) combined with monocaine hydrochloride (1.5 per cent with epinephrine 1:100,000).

Doses—2. Fourteen patients received atropine sulfate (1/150 grain) combined with novocain (2 per cent) with pontocaine (0.15 per cent) and cobefrin (1:10,000).

General Observations—1. The youngest patient was 19 years of age and the oldest was 40.

2. All patients reported a feeling of dryness in the mouth with a lessening of the salivary secretions within fifteen to twenty minutes. This effect continued for approximately one-half to one hour and was terminated in about two hours.

3. The dryer effect obtained was a great aid in every operation performed.

4. In all instances this combination was technically satisfactory.

Comments

1. The most important factor in these experiments is the speed with which this combination of medicaments works.

2. Patients expressed satisfaction with the method.

3. The concentration of the anesthetic content in the Anestube or the Carpule is considerably reduced because of the amount of atropine sulfate added. It may be necessary to

reinject with the *anesthetic only* if sufficient anesthesia is not obtained with the first injection. This will apply particularly in cases where a single injection was planned.

Suggested Restriction of Use—Doctor Henry Boruchoff, visiting ophthalmologist at the Beth Israel Hospital and the Carney Hospital, Boston, who collaborated with me in the present investigation, examined the eyes of some of the patients and observed that the pressure was not raised and the pupils were not enlarged. Doctor Boruchoff also recommended that for the present the use of this arrangement of medicaments be restricted to adult patients who are (1) normal, (2) physically well, and (3) under forty years of age.

Relief in Xerostomia—While recovery from true xerostomia is problematic, the patient may be made comfortable by the use of pilocarpine hydrochloride. Dosage: 0.005 gram (1/12 grain N.F.).[4]

[4]Prinz, Hermann; Rickert, U. Garfield; and Dobbs, Edward C.: St. Louis, The C. V. Mosby Company, Pharmacology and Dental Therapeutics, ed. 8, 1941, p. 426.

Atropine Sulfate Without Injection Local Anesthesia—1. When there is no need for local anesthesia atropine sulfate without the injection local anesthetic can be injected submucosally.

2. For general anesthesia when a faster action of the atropine is desired atropine sulfate without the injection local anesthetic can be injected submucosally.

3. The rapidity of absorption submucosally is about the same as that obtained when using the combined solution, including an injection local anesthetic.

The Use of Demerol Hydrochloride in Combination with Injection Local Anesthesia—When using a combination of demerol hydrochloride with an injection local anesthetic, no atropine sulfate is needed to reduce the salivary secretions because the demerol hydrochloride produces a similar result.

Summary and Conclusions

1. By using a combination of atropine sulfate and an injection local anesthetic (1) satisfactory local anesthesia and (2) a general dryness of the mouth with reduced salivation is obtained.

2. Atropine sulfate in combination with an injection local anesthetic in this presentation is co-medication and can be applied with safety in the dental office.

29 *Commonwealth Avenue*

Author's Note: I am grateful to Doctor Stephen P. Mallett, Oral Surgeon-in-Chief; Doctor James E. Bryan, Resident Oral Surgeon; and the oral surgery staff, Boston City Hospital, for their able assistance in the scientific evaluation of this work. I am also grateful to Doctor Henry Boruchoff, Visiting Ophthalmologist, Beth Israel Hospital, and the Carney Hospital, Boston, for his excellent cooperation in this research.

Announcement of Books Received

APPLIED ANATOMY OF THE HEAD AND NECK, by Harry H. Shapiro, D.M.D., Second Edition, Philadelphia, J. B. Lippincott Company, 1947. Price $10.00.

MEDICAL ETYMOLOGY, by O. H. Perry Pepper, M. D., Philadelphia, W. B. Saunders Company, 1949.

HOW TO BECOME A DOCTOR, by George R. Moon, A.B., M.A., Philadelphia, The Blakiston Company, 1949. Price $2.00.

HANDBOOK OF DENTAL SURGERY AND PATHOLOGY, by Alwin E. Perkins, L.D.S. (Eng.) H.D.D. (Edin.), London, Sylviro Publication Ltd., 1949. Price 30/.

ORAL AND DENTAL DIAGNOSIS, by Kurt H. Thoma, D.M.D., F.D.S.R.C.S. (Eng.) Third Edition, Philadelphia, W. B. Saunders Company, 1949. Price $9.50.

REVIEW OF DENTISTRY FOR STATE BOARD EXAMINATIONS, by Vincent R. Trapozzano, D.D.S., Philadelphia, W. B. Saunders Company, 1949.

HANDBOOK FOR THE DENTAL SECRETARY, by Miriam Bredow, Second Edition, New York, McGraw-Hill Book Company, Inc., 1948. Price $2.75.

ORAL BACTERIAL INFECTION, by Lyon P. Strean, M.Sc., Ph.D., D.D.S., F.A.P.H.A., Brooklyn, New York, Dental Items of Interest Publishing Company, 1949. Price $5.50.

PATHOLOGIC FRACTURE

of the Mandible Following Osteomyelitis

JOSEPH E. SCHAEFER, M.D., D.D.S. and
RALPH C. RUDDER, M.D., D.D.S., Chicago

DIGEST

The patient in this case report experienced a pathologic fracture following the extraction of a tooth in the left mandible. The surgical technique with which bone taken from the crest of the ilium was grafted between the two fragments of the fractured jaw is described.

Case Report

1. The patient, a thirty-eight-year-old woman, was first seen with an ununited fracture of the mandible.

2. She reported having had a tooth extracted in the left mandible which was followed by severe swelling of the left submaxillary region with marked rise in temperature.

Immediate Treatment—1. The patient was hospitalized and given penicillin.

2. An abscess in the left submaxillary region was incised intraorally.

3. Roentgenograms at this time revealed (1) the typical bone changes accompanying an osteomyelitis with (2) a sequestrum in the process of exfoliation (Fig. 1).

4. The sequestrum was removed, leaving a pathologic fracture with an upward displacement of the posterior fragment (Fig. 2).

Observation—The patient was observed over a period of six months and following a period of quiescence, it was decided to perform a bone graft. The patient was readmitted to the hospital on the evening prior to operation. She was given 300,000 units of penicillin in oil on admission. This was repeated in the morning before surgery.

History

The patient's past history included the following: 1. The usual childhood diseases. 2. Mastectomy performed at 19. 3. Forceps delivery at 24. 4. Salpingectomy at 27. 5. The family history was essentially negative.

Examination—1. A marked asymmetry of the left side of the face was revealed with loss of angle contour.

2. All teeth on the left were missing.

3. There were six anterior teeth and a lower third molar remaining in the mandible.

4. General physical findings were negative.

Laboratory Report — Urinalysis: Albumin 10 milligrams. Blood count: Red blood cells 3,775,000: white blood cells 8,200: hemoglobin 12-78.

Surgical Technique

1. Under sodium pentothal anesthesia an open reduction with bone graft was performed.

2. An incision was made along the lower border of the mandible on the left side from the angle to the cuspid area.

3. The bone was exposed at the fractured site, and by sharp dissection the ends of the fracture were freed of all scar tissue.

4. The fractured ends were then cut at right angles to the body of the mandible.

5. A nonelectrolytic metal splint was constructed to conform with the shape of the mandible and was fitted into place. The fragments were alined in order to gain length and restore the lost contour.

6. A bone graft taken from the crest of the ilium was fitted into place between the two fragments of the jaw (Fig. 3).

7. The splint, carrying two buccal phalanges, was held in place by two screws, one in the anterior fragment and one in the posterior fragment

1. ***Roentgenogram demonstrates a well-developed case of osteomyelitis, with sequestrum in process of exfoliation.***

2. *Roentgenogram showing pathologic fracture of mandible and upward displacement of the posterior fragment.*
3. *Roentgenogram showing realinement of bone graft taken from the crest of the ilium to conform to metal splint and bone graft between the two mandibular fragments. (Note loss of x-ray detail ascribed to reproduction of prints.)*

4. *Roentgenogram taken three months postoperatively shows the bone graft in good position with no evidence of bone erosion about the screws inserted into the mandible.*

5. *Roentgenogram taken two years later, showing complete consolidation of bone graft and mandible.*

(Fig 3). (Much of the x-ray detail has been lost in making the roentgenograms into prints.)

Postoperative Course

1. Except for a rise in temperature on the first postoperative day, the course of recovery was without incident.

2. The patient was dismissed from the hospital on the fourth day with no reaction either of bone or soft tissues.

3. Roentgenograms taken three months later (Fig. 4) show the bone graft in excellent position with no evidence of bony erosion about the screws inserted into the mandible.

4. Roentgenograms taken two years following surgery (Fig. 5) with complete consolidation of bone graft and mandible, show no demonstrable changes about the screws with which the splint was attached to the mandible.

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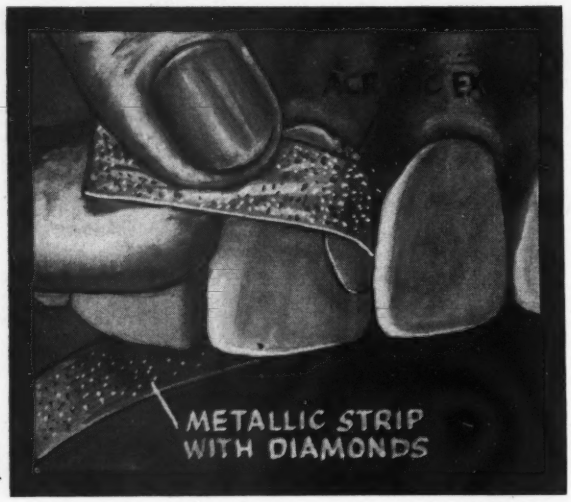


1

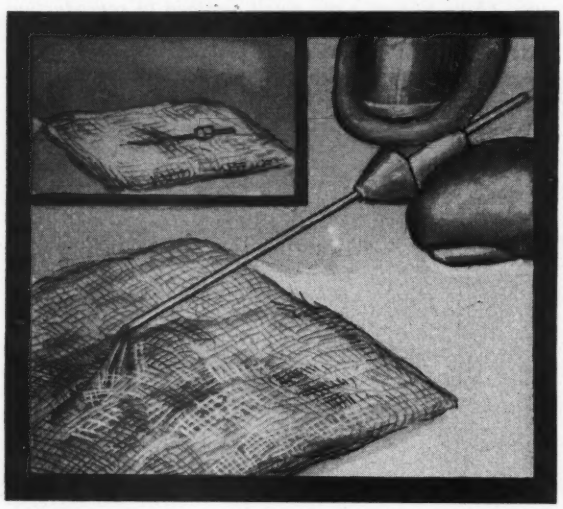
Clinical and Laborator

Removal of Excess Acrylic

David L. Graitcer, D.D.S., Lansdowne, Pa.

1. When excess acrylic becomes hardened at the gingival margin, it is difficult to remove by ordinary methods.

By using a metal-diamond strip the excess may be easily removed. Little pressure and few strokes are needed.

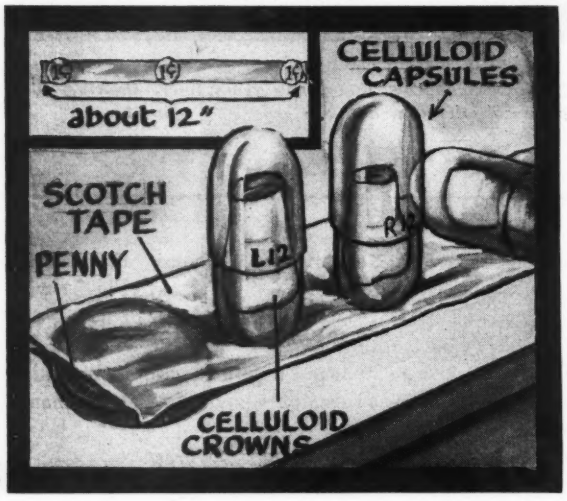


2

Detecting Dull Injection Needles

Robert Reiss, D.D.S., Augusta, Maine

2. Before use the sterile needle is drawn *backward* over a piece of sterile gauze. If the needle catches a thread of the gauze, the point is blunted and the needle should be discarded.



3

Celluloid Crown Holder

J. E. Young, D.D.S., Warren, Ohio

3. For convenience and visibility in selecting crown forms, use a strip of Scotch tape to which the celluloid crown capsules may be easily attached. The strip may be kept flat by weighting it with three pennies.

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SUGGESTIONS . . .

Keeping the Fingers Clean

Francis D. Dunne, D.D.S., Richmond Hill, N.Y.

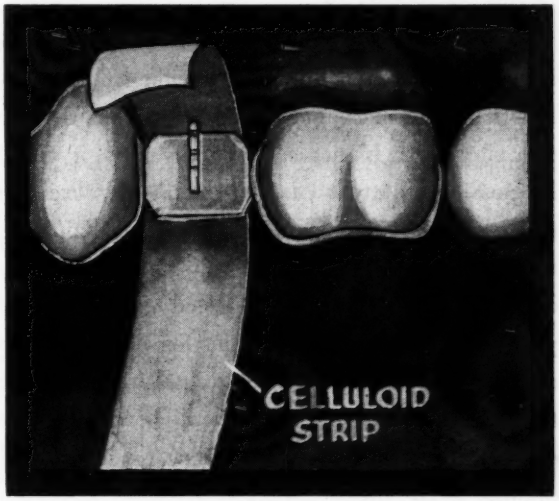
4. When doing work that may soil the hands, it is possible to keep the area beneath the fingernails clean by rubbing the nails over a moistened cake of soap. Let the soap dry under the nails. After the work is completed and the hands are washed the soap is removed, leaving the fingernails clean.

4

Replacing a Broken Facing

B. Gross, D.D.S., Toronto, Canada

5. Before cementing a new facing, cut a celluloid strip to the width of the backing and place the strip between the gum tissue and the backing. Cement the new facing. When the cement has set, the excess may be trimmed between the soft tissue and the backing without lacerating the tissue.

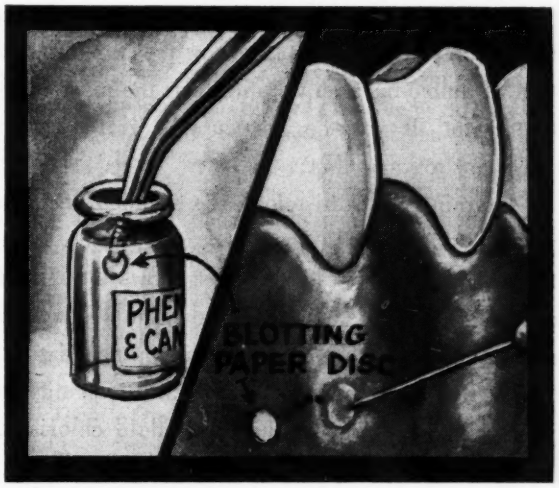


5

A Topical Anesthetic Technique

H. J. Turkenheim, D.M.D., London

6. Discs of blotting paper are prepared by using an ordinary paper punch. Before an injection a disc is saturated in the topical solution and placed at the site of the injection. After the disc is in position for about one minute it is pushed away with the point of the needle and the solution is deposited at the site.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 82 for a convenient form to use.

Send our ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S *Page*

EVERY DENTIST is repeatedly confronted with a question when he considers the treatment of mechanically sound carious dentine. To remove this tissue in its entirety often results in pulp exposure. To allow it to remain *in situ* requires the use of some sterilizing agent to prevent further infection and pulp involvement. The debate has raged for years over the efficacy of the chemicals used in cavity sterilization. Recently Hardwick[1] has attempted to bring order out of this debate and has conducted a series of bacteriologic and histologic studies to determine what chemicals are most effective.

Hardwick states the issue: "An effort has been made to find a chemical germicide suitable for sterilizing the mechanically sound carious dentine of a vital tooth. If such a germicide exists, it would be possible to treat carious dentine by excising the mechanically unsound tissue and sterilizing the mechanically sound tissue. As a result, natural calcific barriers between the infected tissue and the pulp would not be removed, thus lessening the pain of cavity preparation and the pulpal irritation due to mechanical and thermal stimuli because of the cutting of the cavity. In addition, fresh dentinal tubules along which chemical irritants from unsuitable cavity lining and cement would not be opened over the floor of the cavity."

It will come as no surprise to dentists to learn that the results of this study show that the application of ammoniacal silver nitrate is the most effective agent. It will be particularly gratifying to clinicians to know that:

"Examination of histological sections of teeth in which cavities were prepared and which were treated with various bactericides shows that silver nitrate applied to exposed vital dentine produces a remarkably slight reaction in the pulpal tissues. This is due to the precipitation of the silver nitrate in a less toxic form by the tissue fluid chlorides, phosphates and proteins within the dentinal tubules. The precipitation results in diffusion currents carrying still further chlorides, phosphates and proteins into the affected dentinal tubules from the tissue fluid spaces of the pulp. In the majority of cases the silver nitrate is, therefore, unable to exert its toxic effect on the cells of the pulp as it is precipitated in insoluble and less toxic forms before it is able to reach them. These insoluble precipitates may be carried down the tissue fluid spaces of the pulp and peripherally into other dentinal tubules without causing gross damage to the cells with which they come into contact.

"In cases of successful applications of the ammoniacal silver nitrate to exposed vital dentine it is seen to penetrate the tissue fluid channels of the dentine, including the lateral communications of the dentinal tubules. Applied to carious dentine, the superficial layers of the caries become thoroughly impregnated with the silver salts; the deeper layers may also be seen to contain silver particles which however, are thought to represent silver in a less toxic and bactericidal form."

Among other agents Hardwick found that zinc oxyphosphate cement liquid, copal-ether varnish, and zinc oxide-eugenol were effective. Hydrogen peroxide, alcohol, ether, and the standby phenol were found to have little value in sterilizing carious dentine.

Despite the convincing bacteriologic and histologic evidence submitted to emphasize the case of silver nitrate, this agent will not be routinely used in operative dentistry because it stains the tooth by the deposition of insoluble precipitates from the reaction of silver nitrate with the chlorides, phosphates, and proteins of the tissue fluid in the dentinal tubules. A black tooth may be a sterile tooth but it will offend the esthetics of the patient and the dentist. We need a dentine sterilizing agent as effective as silver nitrate but one without the staining properties of this drug.

[1] Hardwick, J. L.: The Sterilization of Carious Dentine, Proc. Roy. Soc. Med. **42**:815-829 (October) 1949.

MEDICINE and the Biologic Sciences

Plantar Warts

The ordinary wart loses its identity when it is found on the sole of the foot. Here it is called a plantar wart, *verruca plantaris*. The name is derived from the site, the plantar surface or sole of the foot.

Structurally, this wart is essentially the same as other warts. Its appearance, the subjective symptoms, its causes, its tenacity and its resistance to treatment make it a specific entity.

The plantar wart occurs commonly. Young women of the late teens and early twenties are most frequently afflicted. The older a person, the less likely he is to have a plantar wart.

Often the wart is mistaken for a stone bruise, thorn, splinter, callus, weak or broken arch. Pain is the most important and most disquieting symptom. This pain is caused by supporting the weight of the body with pressure of the high point created by the wart on the sole of the foot. The particular spot affected, the size of the wart, and the quantity of callus affect the intensity of the pain.

When a plantar wart appears on the ball of the foot or on the heel the pain associated with it is much more intense than when the wart nestles in a furrow or depression. Secondary infection and injury such as occurs in the excessive planing of the callus that surrounds or surmounts the wart, intensify pain and tenderness.

The most representative type of plantar wart is the one appearing as a rounded nubbin protruding beyond the normal contour of the sole. The center of the nodule is usually rough, uneven, greyish black, or brown but it may also be smooth and of normal skin color. Its edges appear as a collarette of hardened yellowish substance commonly referred to as a callus. In fact, the callus is often so large that it completely envelops the wart and hides it from view. The person may never suspect that the true cause of his callus is a plantar wart.

Another type of plantar wart appears in groups, in actual clusters as flat spreading, variously colored, usually small, and multiple warts. They are the shallowest, the most numerous, and least painful of all plantar warts. Also they are the most resistant to treatment.

Injury plays such an important and such a frequent role in the life cycle of the plantar wart that it must be considered as almost an integral characteristic. The punitive effects of (1) locomotion, (2) weight bearing, (3) friction and pressure of ill fitting shoes and stockings, (4) excessive or unaccustomed standing, walking or running, (5) trimming the callus, (6) salves and liquids, and (7) infection constitute the usual injuries.

This minor difficulty is a disabling disease because of the pain and discomfort it causes. (1) Interference with locomotion and weight bearing, (2) interference with physical work or mental concentration, (3) cramped leg and foot muscles, (4) alteration of grace, bodily poise and balance are by-products of the difficulty.

Treatment is manifold. X-ray or radium in doses sufficiently large to cause the absorption of the wart without damaging the healthy skin is the most valuable treatment. These warts are recalcitrant and some even resist x-ray treatment.

Supplementary home treatment with a properly diluted and prepared alcoholic lotion is desirable. In many cases this will prevent spread of warts.

It should be kept in mind that plantar warts belong to an apparently communicable group of skin diseases. Therefore, one should be cautious about walking barefoot at home or abroad, indoors or outdoors. The sole of the foot should be kept supple. And every callus should be looked on with suspicion.

McLaughlin, C. R.: Plantar Warts: Plea for Rational Treatment, Lancet **1**:168-169 (January) 1948.

The Value of Records

In the event of an adverse judgment in a court trial concerning professional malpractice either side may appeal. This may be done by conforming to the pertinent statutory provisions which will be found in each state regulating the right and prescribing the steps to be taken.

Appeals may be carried to intermediate courts as a matter of right in most states. Appeals may go to the state supreme court only in the discretion of the appellate court.

An appeal court does not receive additional fact testimony on the merits. It looks for facts and for the sufficiency of their proof to the verbatim record of evidence taken down by the court reporter in the trial court. The appeal court passes only on disputed questions of law.

Sometimes a malpractice plaintiff can make the case turn on a question of "lay" fact provable by nonexperts. In such a case a defendant is vulnerable. More often, the proof of duty, dereliction, direct causation, and damage will involve facts about medical practices which can be elicited only from qualified experts. Such experts are interrogated largely by hypothetic questions.

In this instance, the more common type of malpractice case, it is the plaintiff who is apt to be vulnerable. He carries a heavy burden in making proof of his "prima facie" case. To

make out a "prima facie" case of malpractice against the practitioner, a patient must prove the four D's (duty, dereliction, direct causation, and damage) by a preponderance of evidence. When any of these elements depends on expert testimony, lay evidence will not suffice.

Familiarity with the four D's makes it possible to expose the fatal weaknesses in many claims put forward. The practitioner should make it a habit to keep records, even if brief, of all his transactions. They carry great evidentiary weight with a jury.

One is entitled to offer properly kept records in evidence. Even if a jotted memorandum of a call or an incident is too informal to be received in evidence as a record made in the course of business it has valuable uses. Provided it was made at or about the time the transaction occurred and at that time was known to be correct, it may be used to refresh the memory. In such circumstances, again, the jury is apt to consider the supported memory more trustworthy.

Smith, Hubert Winston: Legal Responsibility for Medical Malpractice, Chicago, American Medical Association, 1942, *pages* 105-106 *and* 156-157.

Preoperative Studies for Surgery

Most surgeons are aware of the importance of biochemical studies on the preoperative surgical patient. However, the general practitioner or the dentist is often at a loss as to the proper studies to determine the physical harmony of the preoperative patient.

It is a useless procedure to secure many laboratory studies which give irrelevant information. Also it is a mistake to study one biochemical element to the exclusion of others. An intelligent evaluation of the biochemical activity may be gleaned from a study of homologous related groups of blood constituents rather than from one constituent alone.

The severely ill surgical patient should have (1) a hematocrit study, (2) a red cell count and (3) hemaglobin determination. From these the ratio of blood cells to plasma in terms of hemoconcentration and hemodilution is determined. Thus a decision can be made as to whether whole blood or plasma should be administered.

Next in importance is the urinalysis. A solitary urinalysis often is deceiving and fails to reveal valuable information. A urinary concentration and dilution test will unfold more information as to renal function than any other single urinary study. The presence of albuminuria may be physiologic or pathologic. Albuminuria of long duration is one of the hidden causes of hypoproteinemia.

Plasma protein determination is a most important biochemical study in clinical surgery. Many postoperative complications are attributed to a lowering of the normal protein level. A study of blood uric acid is necessary to gain specific information about hypoproteinemia.

Blood uric acid will rise in the presence of endogenous hypoproteinemia. This results from the patient's attempts at replenishing his protein deficiency through endogenous protein secured from his own body. Clinically this state is revealed in the loss of strength and weight. Clinically it can be demonstrated in an elevation of uric acid. The greater the hyperuricemia, the more accelerated is the rate of endogenous protein metabolism. The reason for the hyperuricemia is the fact that uric acid is one of the end products of endogenous protein metabolism.

A frequently requested blood study is an evaluation of the urea nitrogen. An elevation of the urea nitrogen is termed azotemia. It is of three types: prerenal, renal, and postrenal. The clinical surgeon is concerned with the first and third type. The postrenal type occurs when due to some extrinsic factor there is an obstruction to the passage of urine (pelvic tumor, enlarged prostate.)

Considerable concern is attached to prerenal azotemia. The causes are: (1) severe vomiting, especially in intestinal obstruction, (2) loss of intestinal contents, as in diarrhea or duodenal fistula, (3) acute liver damage, (4) diabetic infections, (5) shock, traumatic or postoperative, (6) diffuse burns, (7) intestinal hemorrhage.

Alkalosis may cause azotemia as shown in patients receiving large doses of sodium bicarbonate for peptic ulcers. Blood studies on these reveal alkalosis, azotemia, and hypochloremia.

Current observation on salt intolerance in the postoperative patient has revealed the deleterious effects of sodium chloride. In the light of unpublished studies the role of sodium and chloride ions in the disturbance of normal physiology has been stressed. For this reason accurate chloride studies must include an evaluation of plasma sodium. These calculations will assist in the rational administration of intravenous saline solutions.

An intelligent evaluation of the physiochemical state of the surgical patient can be obtained when related studies are made. Disturbances in blood chemistry are rarely solitary.

Ficarra, Bernard J.: Preoperative Biochemical Evaluation of The Surgical Patient, Am. J. Surg. **78**:504-506 (October) 1949.

Gastric Cancer

In 1940 there were 31,000 deaths from carcinoma of the stomach. By 1960 there will be over 50,000 deaths from this cause. This will be true because deaths from this source will continue to increase as the proportion of the population in the older age groups increases. Mortality statistics indicate that 40 per cent of the population will be in the decades beyond 50 by 1980.

Approximately 70 per cent of the cases of gastric carcinoma occur in males. Of the cases of gastric carcinoma, about 9 per cent are found between 45 and 49, 11 per cent are found between 55 and 59, 24 per cent between 60 and 64, and 36 per cent in persons over 70.

Early diagnosis is imperative. Surgical removal of the carcinoma-

bearing stomach has reached a satisfactory state. Unfortunately complete extirpation of the tumor in most instances is not feasible because the lesion has spread beyond the confines of the stomach.

There are no characteristic "early" symptoms of gastric cancer. A large number of the persons afflicted complain of vague digestive distress. Some note weight loss and some have anorexia. It is not uncommon for many of these patients to be treated for ulcers and often with a favorable response. However, this is only temporary.

It is ironic that Doctor W. J. Mayo detected the signs of the disease in himself too late to benefit by the therapeutic and diagnostic measures which he had helped to develop and apply to others.

Delayed recognition is the fault of the patient in 32 per cent of the cases. In about 28 per cent of the cases the physicians are at fault. It is estimated that about 34 per cent are incorrectly diagnosed. Failure to establish the diagnosis or to refer the patient into proper diagnostic channels accounts for 46 per cent of the cases.

Acute lesions tend to infiltrate the gastric wall and involve the surrounding tissues early in the course of the tumor development. Diffuse spread to the lungs and bone marrow may occur. Death usually follows within less than a year from the onset of symptoms. These rapidly invading neoplasms constitute 60 per cent of all gastric cancers.

Chronic carcinoma with periods of preoperative observation ranging from four and one-half to ten years have been recorded. Many of these have a five-year survival following resection of the tumor.

A palpable epigastric mass is present in 40 to 50 per cent of all patients. Roentgen examination of the stomach is the most important single diagnostic method available today. In competent hands the correct diagnosis can be made in over 90 per cent of the patients. For this reason many men recommend roentgenographic examination of the gastroduodenal tract as part of the routine periodic examinations in the most susceptible

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CLINICAL AND LABORATORY SUGGESTIONS

(*See pages 76 and 77*)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

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708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

$10 will be paid on publication for each suggestion that is used.

decades (fifth, sixth, seventh, and eighth.)

The roentgenologic differentiation of benign and malignant ulcers is not always possible The benign lesion is more frequent in individuals under 50 and in those with symptoms of long duration. Approximately 14 per cent of gastric ulcers are neoplastic. Gastroscopy is a valuable procedure, the correct diagnosis in carcinoma ranging from 75 to 90 per cent of all cases.

Resection of the cancer-bearing stomach offers the only effective cure at the present time. Resection rates have steadily risen. Resection mortality has decreased. Palliative gastrectomy is worthwhile. Five-year survival is obtained in 5 to 7.5 per cent of all patients with gastric cancer and in 25 to 35 per cent of those surviving resection; 80 per cent of these are returned to a useful life.

Maimon, Samuel N., and Palmer, Walter Lincoln: Gastric Cancer: Diagnosis, Cause and Prognosis, Postgrad. Med. **6**:201-211 (September) 1949.

Allergy in the Common Cold

In the epidemiology of the common cold it is recognized that contributing factors are important even though their exact role is obscure.

Recently some authorities have been looking to allergy as an important factor in the susceptibility to colds. Allergic conditions are frequently initiated or exaggerated by a fall of temperature and increased humidity. The mechanism of this reaction is probably related to increased permeability of a susceptible membrane, allowing the antigen to contact its specific reagin in the cell more rapidly.

The common cold is an allergic response in susceptible persons to contact with a specific protein, which is the cold virus or its products. The diminished capacity to maintain effective circulation and to tolerate sudden fall of temperature exhibited by the cold-susceptible patient is often

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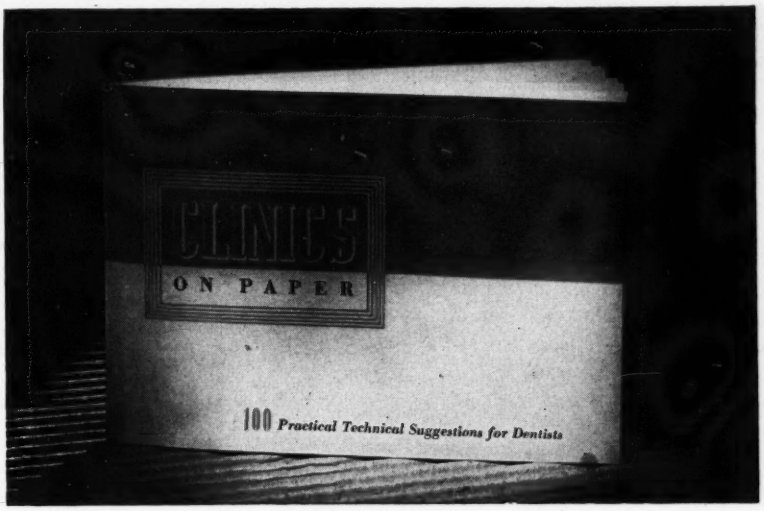
Volume Three



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A typical letter concerning previous volumes . .

The Dental Digest
Gentlemen:-
Inclosed find check for a copy of Clinics on Paper which you will please send to the inclosed address with my compliments.
It's too bad every dentist does not know of this clever helpful publication. Many thanks
Resp. yours,

The above is a typical letter concerning previous volumes of *Clinics On Paper*. Your opinion of volume three will coincide with that expressed in this letter. Order your copy today. The coupon is for your convenience.

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observed in allergic patients. The response of the allergic person to these environmental factors results in an outpouring of histamine into various shock centers, particularly into the respiratory tract, in sufficient quantity to weaken the local defense mechanism. This prepares these tissues for acceptance of the virus of the common cold or of secondary invaders.

In several studies conducted recently it was reported that 80 per cent of cold-susceptible persons had various allergies or came from allergic families. The most common pathologic change observed in the upper respiratory tract of cold-susceptible persons is hyperplasia of the mucosal oral lymphoid tissues. These patients suffer constantly from postnasal drip and mouth breathing due to nasal intumescence, frequent sore throats, attacks of laryngitis and stomatitis.

The person with hyperplastic tissues highly susceptible to colds rarely has a cold lasting only four to five days. Almost invariably a secondary infection of the sinuses develops, lasting three to six weeks. Apparently, the mucosa must be injured specifically by the virus to cause these long colds. The cold-susceptible patient often presents a borderline or subclinical rather than a frank type of allergy.

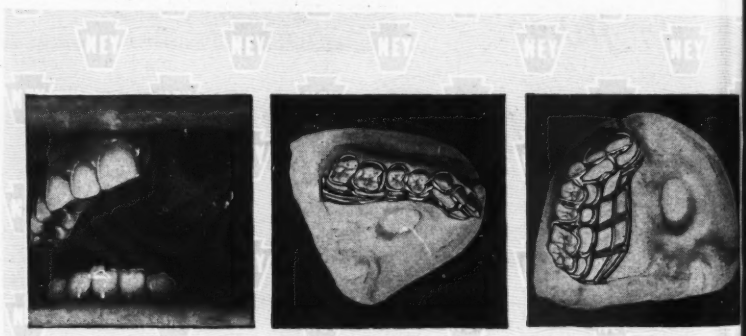
Fox, N., and Livingstone, G.: Role of Allergy in the Epidemiology of the Common Cold, Arch. Otolaryng. **496**:575-586 (June) 1949.

N.S.S.* SOLVES ANOTHER TOUGH ON

The inquiry that first brought this interesting problem to o attention read, in part:

"It has occurred to me that if it were possible to make gold casting for this case using the Ney Surveyor tech and hold these teeth as one unit with both buccal and ling bracing, under strain they would react as a unit and mig be strong enough to withstand the constant downwa pressure of the case on the left side.

"After looking this case over, you may decide that it is i possible to build a successful cast appliance; if so, please t me frankly along with any other suggestions you may have



This child lost all teeth and maxilla on the left side from surgery required for removal of a cystic muscular tumor.

Analysis on the Ney Surveyor indicated that it would be possible to design an appliance which would have the desired stability and retention.

The sturdy framework was cast in NEY-ORO G-3 Well designed clasps took advantage of all favorable undercut conditions for bracing and retention.

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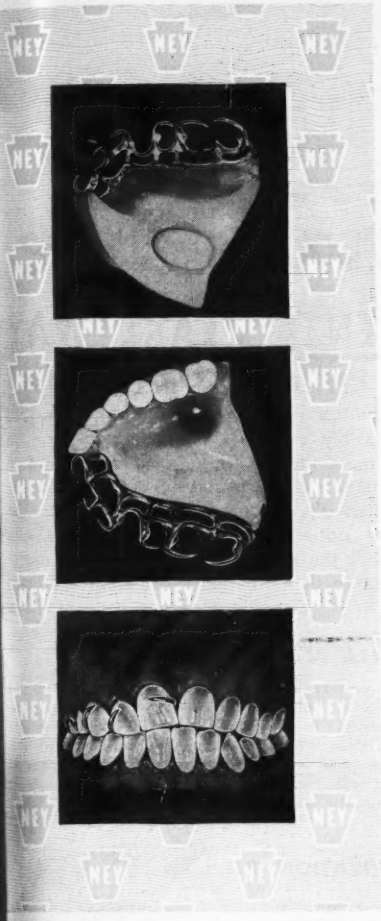
Contra-Angles

The Reds Are After Him

Lately I have been reading that the Communists of the United States have put J. Edgar Hoover and the FBI on their list as Communist enemy, Number One. That should be flattering to Mr. Hoover and his fine organization. Anyone who is singled out as a special sore spot by the Communists must indeed be an outstanding American.

We can expect anything from the Reds but when a smart fellow like Bernard De Voto, a feature writer for the cultural *Harper's* magazine, begins to follow the party line and call Mr. Hoover a leader of the American gestapo, we should begin to worry. Sure, we all want liberty to come and go and do what we please. We don't want to be investigated, interrogated, shadowed, and questioned. Nor do we have to fear such things if we are keeping ourselves on the level. If you are keeping your fingers out of other peoples' money in the bank till, engaging in no kidnapping, white slavery, flights to avoid prosecution for crimes in interstate commerce or against the government, a citizen has nothing to fear from the FBI. I never heard of any innocent person who was plagued or persecuted by this agency.

Under a Presidential directive issued in September 1939 the FBI was



4 The appliance was finished in acrylic, and this view of it from the tissue side shows the unusual clasp design worked out by the Ney Surveyor System.

5 Here is a palatal view of the denture, which goes to place by having the anterior clasps engage their undercuts first, followed by the bicuspid clasp and finally the molar clasps.

6 The completed appliance in the mouth brought the following case report: *"The casting fitted the mouth perfectly and had splendid retention; the finished appliance was more stable than any we had previously constructed."*

Case history #31 illustrates the real and practical service rendered by the Ney Surveyor System.

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instructed to protect the internal security of the United States from saboteurs and spies. How well the agency did the job may be answered by asking any citizen if he *knows* at first hand any act of sabotage or espionage that was not discovered. Even with the wars over the dangers of sabotage and espionage continue from another source. Keeping an eye on this present potential enemy and the "American" friends of that country is still a job for the FBI—and a big one. The Russians have been stirring up trouble for years. There is nothing in their history that would encourage us to think that they will sit still in the future. The Russians know that their most potent enemy in this country is the FBI. And they also know that this organization is more widely admired and respected by American citizens than any other federal agency. Any propaganda device that would cast doubt and suspicion on the FBI and bring it into discredit before the people will accomplish the Russian purpose

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which is for American citizens to lose faith in their own institutions. When such faith is lost, the people perish.

Certainly there are things that we do not like in the federal government—and that goes for local governments, too. In fact, there are things that we do not like about our families, our friends, and even now and then, we find ourselves disliking ourselves. The way to correct such conditions is to talk things over by free debate, ask for facts and figures: names, dates, and places. Don't swallow tall tales and vague rumors. We have freedom of speech which should be used to spread information, ideas, knowledge, and ideals. Free speech does not mean the privilege of maligning people and institutions. If we talk or write improperly about people we may be sued for slander or libel. But God and the government seem to have no defence. In these areas we seem to be free to utter blasphemy and calumny, both of which the Reds do in vicious degree.

Somebody is certain to say that this subject has no place in a dental journal. I hope they do, for this is my chance to tell them that Communism not only destroys personal initiative and private property but personal dental and medical practice as well. Wherever Communism has taken over, dentists and physicians, as members of the middle class, are treated as enemies of the workers which means that they are "liquidated" if they show too much independence—examples, Czechoslovakia, Poland, and now Hungary. If they escape with their lives they do not escape with their individualism. That seems to me something that every dentist and physician would wish to keep.

Two Epigrams

Lloyd Dodd of Decatur, Illinois and Orville Coomer of Louisville, Kentucky, speaking before the Mid-Continent Dental Congress in St. Louis, turned out a couple of neat epigrams.

In speaking of statism, the welfare despotism, compulsory health insurance and such subjects, Dodd said: "I'd rather be an eagle proudly looking for my next meal than a caged canary assured of its birdseed."

"The mind," said Coomer, "is like a parachute. It functions only when open."

Rushing to the Drugstore

A lot of people have been told by newspaper advertising and radio programs that the day of the abominable common cold has passed. All they must do is buy a package of antihistamine tablets and the sniffles, drippings, chills and fever, creaking joints and headaches are over. Just like that!

The *Medical Times*[1] does a good job of expressing the present knowledge in antihistaminic therapy:

"Favorable reports on the use of antihistaminic drugs in the treatment of a variety of allergic conditions abound in the medical literature of the past few years. These new agents reduce or prevent the effects of histamine or a histamine-like substance generally accepted as a major factor

[1]The Common Cold, Research Department. *Medical Times* **77**:549-561 (December) 1949.

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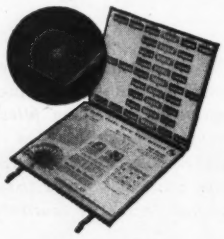
Dentists and patients alike shun that "tell-tale" denture look. No tooth manufacturer could possibly make sufficient molds, nor so individualize the anteriors to meet the countless variations found in human teeth. The Dentist, therefore, must carefully select correct basic size, form and color—then alter the artificial anteriors to the requirements of the individual patient. The **versatility** of Denta Pearl plastic teeth, together with the simplified technique and materials, makes this routine procedure in more and more dental offices.



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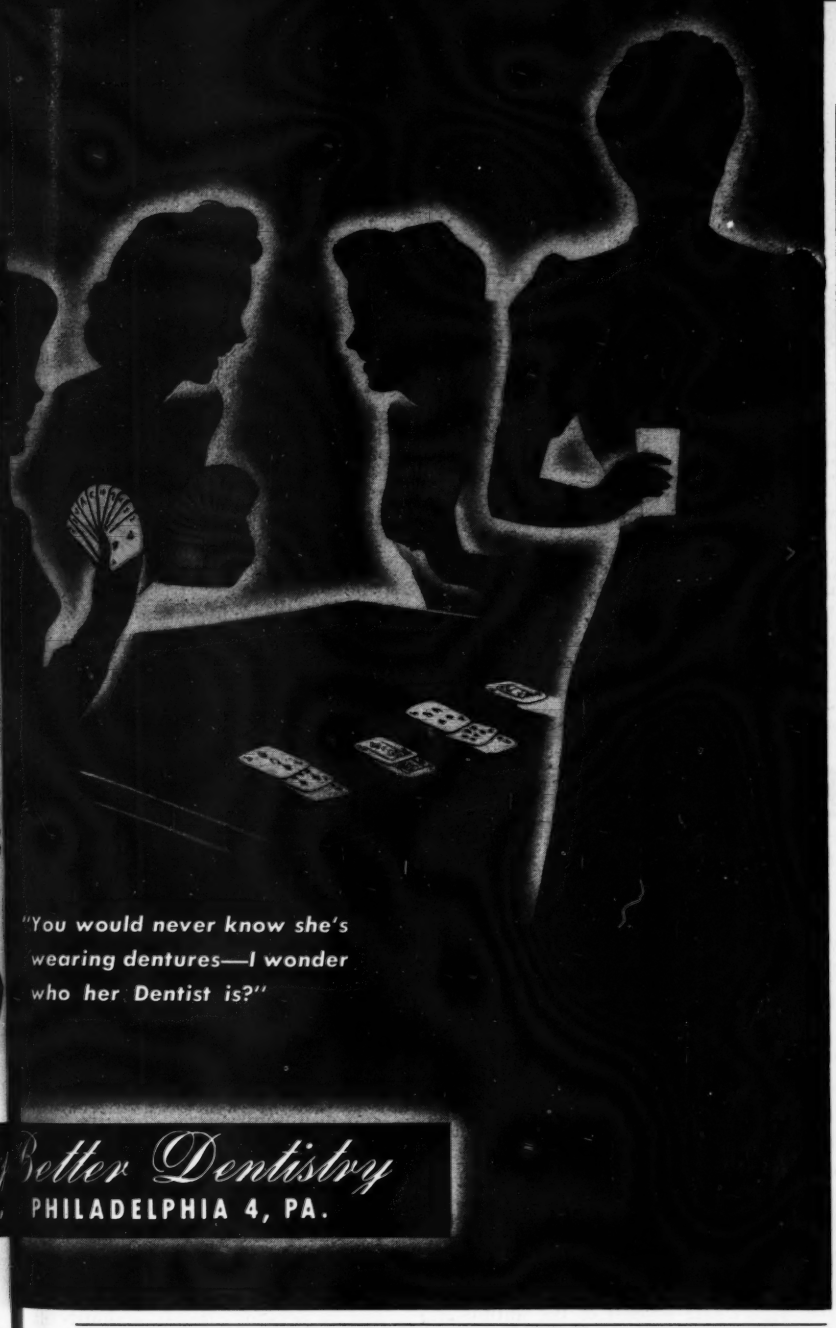

in the production of allergic symptoms.

"The finding of histamine in the nasal secretions of persons suffering from the common cold provides significant evidence that a phase of the common cold is an allergic phenomenon. (Furthermore, symptoms of the common cold resemble those of such allergic diseases as hay fever and vasomotor rhinitis, even though its etiological agent is a filterable virus.)

"That antihistaminics can interrupt the allergic reaction in colds, first was noticed in a patient being treated for an alimentary form of allergy. Surprisingly, a cold contracted while under this treatment was aborted.

"Antihistaminics are now known to provide symptomatic relief from the common cold. When taken at the onset of the prodromal symptoms these drugs may actually abort the cold. Their effectiveness is inversely proportional to the lapse of time following onset of symptoms before treatment is begun. By 'onset' is meant the first sensation of soreness in the nasopharynx, the first engorge-

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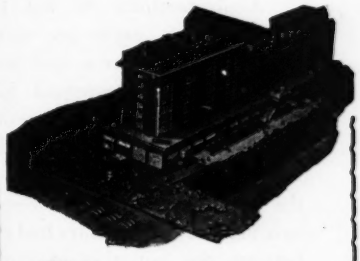

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ment of the nasal mucous membranes, or whatever an individual has learned means the initial symptoms.

"Antihistaminics do not prevent complications, such as secondary sinus infection, once a cold has fully developed. In a series of 572 patients with colds, 90 per cent were cured when antihistaminic therapy was begun within the first hour of the appearance of symptoms. When two, six and twelve hours had elapsed between the initiation of symptoms and medication, respectively, 87, 74, and 70% of the patients were cured.

"A cold was considered to have been aborted or cured when all signs and symptoms disappeared completely within twenty-four hours of the beginning of treatment and remained absent for at least forty-eight hours after treatment was stopped. When antihistaminic therapy was commenced too late to secure an arrest, the resultant colds lasted only three to five days. No complications occurred and symptoms were mild. It was observed that these mild and attenuated colds conferred a normal degree of immunity.

"Antihistaminics inhibit the serous discharge from the respiratory mucous membranes. They inhibit the cough reflex probably through elimination of postnasal dripping, an effect of special benefit to children. They abort herpes when taken immediately after appearance of the itching, burning wheal. The cures obtained are not limited to patients known to be allergic.

"Compared with common remedies for colds, antihistaminics show some superiority. They gave a higher percentage of cures than a combination of codeine sulfate and papaverine hydrochloride, a preferred cold remedy, when administered one, six, or twelve hours after onset of symptoms.

"Antihistaminic medication avoids the use of drugs which irritate the nasal mucosa. The nasal mucosa is able to function normally in combating infection if its physiologic processes are not disturbed.

"Dosage is in the range of that used in other allergic manifestations. For many of the antihistaminics the dose is 50 mg. for adults and 10 to 25 mg. for children every four hours while awake, while with others slightly smaller dosages are required. Some few are given in dosages of 100 mg. For the newest antihistaminic recently marketed only 2 to 4 mg. are required. When symptoms persist beyond the first day, medication is continued for its palliative effect.

"With the short periods in which treatment is required, the incidence of side effects is small. There may be drowsiness, dryness of the mouth, headache, dizziness, or nausea depending on the likelihood of the particular drug chosen to cause it.

"Using several of the antihistaminic drugs, one worker encountered reactions severe enough to demand discontinuing the drug in 8.7, 3.3, and 18 per cent respectively, of patients receiving the drugs. Clinical reports on one antihistaminic with a high therapeutic index have indicated that it causes a lower incidence of side reactions than any other antihistaminic instances. However, the action may not last as long and it may be necessary to take the drug more frequently. A sedative effect may be an asset in persons willing to remain in bed during treatment. It is a hazard in ambulatory patients, especially those who must operate industrial machines.

"This investigator reported complete and permanent relief from symptoms within six hours in 3 per cent of uncomplicated colds when antipyretics and analgesics were used along with an antihistaminic compound. Among 500 cases of all types of upper respiratory tract infection, 85 per cent of cases showed benefit. Convalescence was more comfortable and shorter than had been anticipated. This same worker thought the 65 per cent benefit obtained in allergic adults with bacterial infection made the trial of antihistaminic drugs worth while in this group.

"The value of the antihistaminic drugs in aborting a cold when administered in the first few hours of the syndrome seems to lessen, however, as the duration of the cold increases. The administration of analgesic and antipyretic drugs such as acetylsalicylic acid and acetophenetidin appears to provide synergistic activity and to materially enhance the effect of the treatment in later stages of the coryza.

"In summary, it would seem that antihistaminic therapy at the first signs of a cold might abort a large proportion of common colds. Eliminating the factors responsible for the spread of colds, sneezing, coughing, and profuse discharge from the nose, which antihistaminics are known to do, should markedly reduce the incidence of colds. The value to industrial plants, to projects where manpower is at a premium, to statesmen, to concert, radio, and movie artists, and to persons already seriously ill, as well as to others, is obvious.

"It is hoped that this therapy will reduce the annual 100,000,000 days lost from employment and the estimated cost of this to the public of 1 to 3 billion dollars."

Dentists are going to be asked by their patients what they think of the use of the antihistamine drugs. They could do no better than quote from the timely article in *Medical Times*.

Dentists have a big stake in cold prevention and control. Few situations are as disorganizing to dental practice.—E.J.R.

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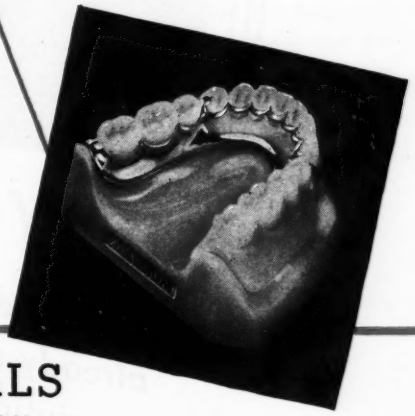

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Thousands of practitioners have already ordered this tenth reprinting since it was announced a few months ago . . . . . .

THE NEW CHART: There are 31 charts in the *tenth* (and latest) reprinting of *Visual Education in Dentistry*. The newest addition to this ever-popular series of charts most frequently used by practitioners everywhere in their patient-education programs is a four-page chart in color entitled *THE DANGERS OF PYORRHEA AND POSSIBLE COMPLICATIONS*. It portrays pictorially possible complications in the blood stream which could result from a pyorrhetic condition (see pages 395-98 in September *Dental Digest*). Many practitioners are familiar with the other 30 charts in the booklet which they have been using regularly in their practices for many years. Each chart tells a specific story with easily understood illustrations and descriptions.

TYPICAL COMMENTS: "I have just seen your latest reprinting of Visual Education in Dentistry and think it is one of the most interesting and valuable sources of dental information for patients. I am planning to have my new office in about two weeks and by all means I should like to have at least two copies at that time. Will you, therefore, send the copies by air mail, charging me for the extra postal expense. Congratulations on the tenth reprinting!"—A. S. L. W. "Will you please send me information regarding patient-education material you have available. I am already using Visual Education in Dentistry with great satisfaction." D. L. R. "I am a subscriber to Dental Digest and have received Visual Education in Dentistry. I would like very much to have a second copy of the booklet. Enclosed is another $1.00. I make great use of this educational material." I. P. Space limitations make further quotations impractical but the above comments from recent letters exemplify the high regard of the dental profession for the booklet.

OVER 90,000 DISTRIBUTED: Several thousand copies of the latest reprinting have already been sold, bringing sales, since the original edition, over 92,000. Many practitioners are ordering two or more copies, realizing that the potential value of these charts cannot be over-estimated. Every practitioner should have at least two copies—one for use at the chair; the other for reception room use. *A better investment at small cost could not be made.*

SAME PRICES: The original edition of *Visual Education in Dentistry* contained 12 charts. Since then it has been enlarged considerably and at present the booklet contains 31 charts—the complete series to date. The prices of the original edition were $1.00 to regular subscribers to Dental Digest and $2.00 to non-subscribers. Those very same prices apply today despite the fact that paper and printing costs alone have increased over 100% since the original edition. We know the value of this material in making the public realize the *value of periodic dental treatment and the danger of neglect* and we feel it is our duty to keep the price of such ethical material within the means of everyone. We refer non-subscribers to Dental Digest to the special subscription combination offer mentioned in coupon. Why not send your order now?

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I'm in General Practice

What *is* "general" practice? . . . A matter of chisels and burs only? Doctor S. A. Allen looks at his—and *your*—practice through the eyes of Saint Apollonia, patron saint of dentistry, and finds that there's more to general practice than merely "chopping and grinding" and devising replacements. If the general practitioner is to progress beyond the stage of "tooth carpenter" and jeweler, he must broaden his outlook—and his services.

★ ★ ★

"The New Era With Abrasive Technique" . . . It's here—cavity preparation without pain or fear! Doctor Stanley C. Brown tells the story, quoting Doctor Robert B. Black (father of the airbrasive method) and Doctor William R. Mann (representing a group of dentists who have learned and used the new technique). No one predicts that this new technique will entirely replace the use of burs and stones, but all who have witnessed demonstrations are convinced that the airbrasive method is much more acceptable to the *patient* than any other method of cavity preparation yet devised and that its use by the dentist would tend to overcome patient resistance to dental treatment.

★ ★ ★

Light in touch, but heavy in impact, is the article, "You Want To Be a Dentist." Doctor Arthur Isaac balances humor with sound criticism in writing an article addressed to prospective dentists—but which only an experienced practitioner can fully appreciate. You will enjoy his remarks on "The Office," "Psychologic Approach," and "Business Approach." Sample: "—no tooth is ever as sensitive as the patient whose feelings have been hurt—."

★ ★ ★

Of course you're not like "Sorrowful Doctor Jones"—or are you? Doctor Joseph Murray creates this composite Jones character who suffers from pessimism, defeatism, and general neurotic ailments. Is it possible that, after describing and classifying so many groups of patients as neurotic, we are now forced to admit that dentists, too, may sometimes stumble into a psychological pitfall or two? This article waves a warning signal.

★ ★ ★

Dentists—and dentistry—jump the boundaries of the dental office, and pop up in the news, in popular music, in the theater, in sports, and in almost every department of modern life. Doctor Rudolph Levy has kept tabs on some of the current classic examples, and tells about them in his article, "Dentistry Supplies the Human Touch." . . . As if to corroborate his findings, Jay Uttal writes of Horace J. Brown, Jr., "Deadeye Dentist," and Gordon Duncan writes about Doctor Zola, magician-dentist. We believe you will enjoy all of these articles.

Canker Sore and Smallpox Vaccination

Case History

A 30-year-old woman who has multiple severe recurring canker sores of the mouth has been treated with smallpox vaccinations.

Results of Treatment—There was a typical "take" to the first vaccination and immune reaction followed each vaccination until ten had been given (at weekly intervals.) Improvement occurred. A few canker sores formed but they were shallow and caused little pain.

Recurrence—The canker sores gradually returned. A second course of vaccination was given. Again, the first vaccination resulted in a "take" and improvement followed. When the canker sores again became severe and a third series of vaccinations were given, for the third time in a twelve-month period a "take" resulted on the first vaccination of the series.

Problem—1. Why should there be an apparent loss of immunity to the smallpox in such a short period of time? 2. How can the immunity be made permanent? 3. What other treatment may be recommended?

Causes of Herpetic Ulceration

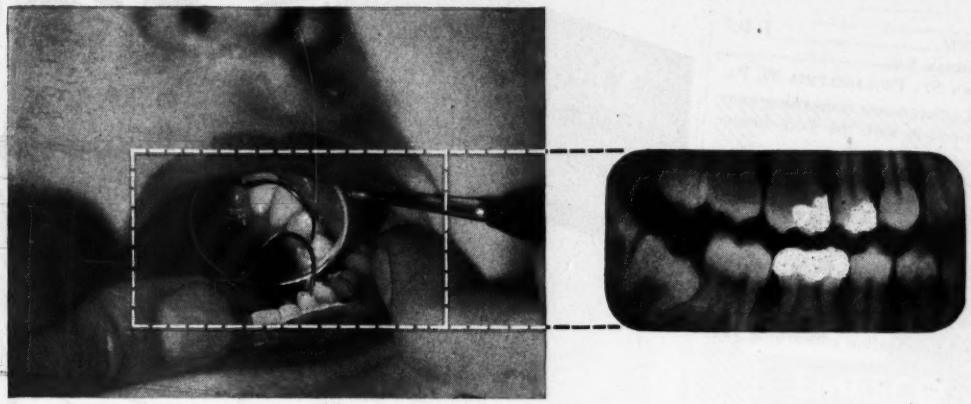
The newest knowledge of herpetic ulceration of the mouth indicates that it is caused by the virus that causes herpes simplex. The following conditions, mentioned as causes in the past, probably act as conditioning factors to permit the virus to produce the lesions: (1) vitamin B complex deficiency, (2) hyperthyroidism, (3) fevers, (4) leukemias, (5) menstruation, (6) mild trauma, and (7) constitutional peculiarities.

Characteristics of the Condition

1. A typical feature of herpetic infection is that it does not produce an immunity of long standing.

2. Persons who have recurrent herpes exhibit a low antibody titer to the herpes simplex virus.

(*Continued on page 96*)



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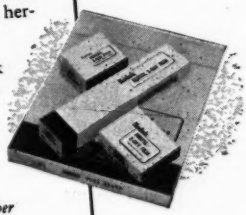

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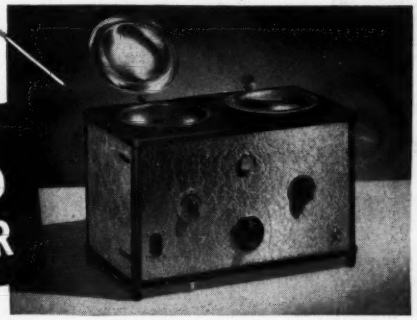

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(*Continued from page* 92)

3. Members of a family who have herpes have a low antibody titer.

4. Patients with recurrent herpetic stomatitis often have difficulty in obtaining a "take" from smallpox vaccination.

Therapy

1. There seems to be no way in which the immune period can be prolonged. The time between vaccinations might be lengthened but this is merely a matter of convenience.

2. The patient should be studied thoroughly and all logical adjunct methods should be used.

3. Allergy should be considered.

4. Oral hygiene should be practiced.

5. An emotional instability should be considered, and if present, treated.

6. An antihistaminic drug could be tried.

7. The newly developed antibiotics, particularly aureomycin, which have been effective against some viruses, should be kept in mind.

From Queries and Minor Notes, *Journal of the American Medical Association* **141**:362 (October 1) 1949.

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